SKIN, 
ISOCYANATES, 
AND MOCA

Special Supplement to 
PMA Comprehensive Safety and Health Plan

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Introduction

It may be surprising to realize that work-related skin diseases accounted for twenty percent of all the occupational diseases in the United States in 1988 (Department of Labor). Contact dermatitis is the most common skin disorder reported as an occupational disease. It is the second most common occupational disease. Four-fifths of the cases relate to irritating chemicals such as solvents, cutting oils, detergents, alkalis, and acids.

Healthy skin is a good barrier. It limits loss of water and other essential compounds from the body. It also diminishes the penetration of potentially toxic substances into the body.

The barrier function of skin, however, is not permanent or constant. Chemicals can pass through the skin. The passing through process is known as permeation. Permeation is a passive process that may vary from chemical to chemical.

This document examines how chemicals, particularly isocyanates, MOCA, and solvents, can be absorbed through skin and what their health effects are once they are in the body.
Chemical Absorption through Skin

Several factors determine how easily a chemical is absorbed through the skin. They include:

- The chemical and physical properties
- The base or vehicle the chemical is in
- The wetness of the skin
- The integrity of the skin
- Whether the skin is covered

These factors are discussed in the following sections.

**Chemical and Physical Properties**

Chemicals with a high molecular weight pass through skin more slowly than those with a low molecular weight. Compounds with a molecular weight of greater than 500 microns pass through skin very slowly if at all. Compounds with low molecular weights tend to penetrate skin rapidly.

Chemicals that are both fat soluble (lipophilic) and water soluble (hydrophilic) tend to penetrate skin faster than those that are one or the other.

**The Chemical Base or Vehicle**

If an agent is fat soluble and carried in a water soluble vehicle or base, it will penetrate through skin more quickly than those that do not have both fat and water soluble characteristics.
The Wetness of the Skin

Increasing the wetness (hydration) of the skin increases its permeability up to ten times. Sweating increases the absorption of chemicals which already have properties that make them capable of penetrating the skin (low molecular weight, etc.).

The Integrity of the Skin

Cuts, abrasions, and skin diseases such as psoriasis or eczema can increase the absorption potential and diminish the barrier function of the skin.

The skin can absorb toxic amounts of a chemical even when the airborne concentration is within legal limits. Skin can also absorb compounds that are not liquid. Skin (percutaneous) absorption is often difficult to detect, hard to measure, and not readily apparent.
Whether Skin Is Covered

When skin is covered, for example, when it is encased in a glove, it becomes occluded. *Occlusion*, which closes up or blocks the normal vapor transfers of the skin, is another factor that enhances skin absorption. In one study, covering skin with an impermeable barrier resulted in a fiftyfold increase in penetration compared with that of the same chemical in an identical formulation with uncovered skin.

The occlusion factor is especially important in occupational settings. Gloves that serve as an incomplete barrier to chemicals may actually enhance skin absorption. This happens because gloves:

- Increase skin wetness and temperature, which increases permeability
- Increase chemical contact time and concentration, especially for volatile chemicals that would otherwise evaporate from the surface of skin

Gloves worn to protect skin from chemical contact must be truly impermeable to the chemical of concern.
Chemical Exposures in the Polyurethane Industry

In the castable polyurethane industry, employees may be exposed to the following kinds of chemicals:

- Isocyanates
- MOCA
- Solvents

Isocyanates

Isocyanates like TDI, MDI, and HDI are monomers. They can react with one another to form large chain-like chemicals called polymers. The industry typically uses intermediate-sized isocyanates called prepolymer, which can also contain "free" (unrelated) isocyanates.

Isocyanates are of particular interest in occupational medicine because of their capacity to cause respiratory disease at very low levels of exposure.

MOCA

Skin is MOCA’s main route of entry into the body. In facilities where MOCA is used, careful selection of protective clothing following the MSDS is an important safety factor.

Solvents

Use of solvents may vary from facility to facility. Employees must exercise care if they use solvents like toluene, benzene, MEK, trichloroethane, and others. The MSDS and manufacturer’s manual for a solvent are sources for instructions and effective protective clothing.

The following sections discuss exposure to isocyanates and MOCA, their effects on skin, and how to prevent exposures.
Exposure to Isocyanates

Employees can be exposed to isocyanates while performing the following activities:

- Weighing raw materials
- Hand mixing
- Pouring urethane into molds
- Pushing filled molds into an oven
- Removing partially cured urethane casts from molds (residual isocyanates)
- Loading partially cured urethane casts onto carts for curing ovens
- Cleaning urethane products off the mixing machine
- Cleaning work areas
- Doing maintenance on mixing machines
- Disposing of waste
- Cleaning a spill
Health Hazards of Exposure to Isocyanates

Immediate or Short-Term

Short-term effects include:

- Redness—may be localized to the area that came in contact with the chemical

- Swelling—from the skin reacting by increasing blood supply to the site of the injury. The water content within tissues increases to fight against further injury

- Blistering—due to tissue destruction in the layers of skin. The severity depends on concentration of irritant and duration of skin contact

- Pain—described as burning or stinging in quality

This kind of skin reaction is known as acute, irritant contact dermatitis because it is immediate, due to irritating properties of the chemical, and caused by contact to skin.

TDI and MDI can both cause irritation of the skin.

Long-Term

A weak irritant requires repeated exposure before dermatitis becomes evident. The development period of this type of dermatitis varies from days to years depending on whether the contact is constant or intermittent.

The first sign of long-term effects may be skin that looks glazed and dry, with a chapped, scaled appearance or cracking and fissuring.
Sensitization

TDI, MDI, and other isocyanates are capable of producing sensitization when skin comes in contact with them. Sensitization is the body’s hyperreactivity. It is an allergy-like response to a substance that a susceptible individual has touched or inhaled. Sensitization may develop from a one-time exposure (accident or spill) or repeated exposures at much lower levels. Skin sensitization has been produced in humans whose respiratory tracts were protected by respirators but who had repeated skin exposures.

Skin sensitization reactions may include:

- Rash—may spread on the body if the site of contact is severely inflamed
- Hives—may develop on immediate contact
- Swelling — may develop of the affected area and/or arms and legs
- Blistering
- Itching

Reactions may be more pronounced where skin is more sensitive (eyelids, genitals).

Future exposure to the chemical will cause a recurrence of symptoms. There is some evidence that if future exposure is completely avoided the individual may lose his sensitivity. But sensitization is usually permanent. Once sensitized by contact, ingestion or even inhalation of the chemical may reproduce the response at previous reaction sites.
Sensitization continued

Skin contact can also cause respiratory sensitization. The lungs become sensitized to isocyanates and the sensitization shows up as asthma-like symptoms such as:

- Tightness of chest
- Shortness of breath
- Coughing
- Wheezing

If exposed through inhalation again, the person can have a recurrence of the asthma-like symptoms. This can occur at levels much lower than TLV limits. A person who has respiratory or skin sensitization has to avoid all further contact with isocyanates.
Preexisting Allergies

Employers should inform individuals who have preexisting allergies or asthma, as well as other employees, about sensitization before they work with isocyanates. Some controversy exists over whether these individuals should or should not handle isocyanates. At this time there is no evidence that they are at any increased risk of being sensitized, so no rational basis exists for excluding allergic individuals from jobs involving potential exposure to isocyanate.

An individual who has symptoms of bronchial hyperreactivity (sensitivity to more than one chemical) must consult a physician for diagnosis and counseling before working with isocyanates. Individuals with specific isocyanate bronchial hypersensitivity should avoid any contact with, or exposure to, isocyanates.
Identifying Susceptibility

There is no simple test to identify the people most susceptible to sensitization.

Once sensitized, a person can have an immediate or delayed reaction to another exposure.

How isocyanate sensitivity develops is not yet clear. Tests have shown the existence of specific antibodies in some isocyanate-sensitive individuals (mainly in isocyanate asthma), but these antibodies are also associated with exposures that did not result in respiratory or other symptoms. It appears that only a small proportion of isocyanate-sensitive individuals (approximately twenty percent) have these antibodies. Other mechanisms are under investigation.
**Effects on Preexisting Diseases**

The exposure and injury caused by contact with isocyanates may worsen preexisting conditions like psoriasis and lichen planus.

Exposure to isocyanates can aggravate respiratory diseases (chronic bronchitis, emphysema, bronchiectasis, previous sarcoidosis, and TB).
MOCA

MOCA does not cause contact dermatitis or sensitization. The main concern with skin contact in relation to MOCA is that skin is its route of entry into the body.

The American Conference of Governmental Industrial Hygienists (ACGIH) classifies MOCA as a suspected carcinogen causing bladder cancer. It has a long latency period, so an individual cannot observe effects at the time of exposure.

Employees who handle MOCA need to have appropriate protective equipment to prevent any skin exposure and decrease total body exposure.
Solvents

Do not use solvents for cleaning hands or spills. Solvents cause drying of the hands and diminish the barrier function of skin besides causing other skin, respiratory, and nerve effects.
Prevention and Control of Exposure

The best way to control exposure is to practice sound industrial hygiene. Wear appropriate protective clothing whenever there is any possibility of direct contact with isocyanates or MOCA.

Protective clothing may include:

- Appropriate gloves
- Safety glasses or goggles
- Face shields
- Aprons or coveralls
- Footwear
- Chemical-protective jackets and pants
Glove Selection

Since hands are the most exposed parts of the body, gloves are important protective equipment. Many varieties of gloves are available. Use of nitrile or neoprene gloves is recommended with isocyanates.

Several issues related to gloves need to be kept in mind. Chemical breakthrough is rapid for some chemical and glove combinations. This means proper glove selection is critical to avoid exposure.

It is also important to understand the following:

- No sensation is involved with skin absorption so employees have no warning that it is occurring
- The hand becomes moist from sweat while wearing gloves so that there is no sensation of liquid entering from the outside
- Gloves may not show any perceptible change in appearance when breakthrough occurs

Vendors such as CLI Labs offer tests that let you check on-site whether breakthrough has occurred.

In addition, standardized tests determine how long you can use a glove before breakthrough occurs. Do not use gloves for longer than the determined breakthrough time.
When To Discard Gloves

Discard gloves that show signs of wear through degradation, penetration, and permeation.

*Degradation* occurs when a reaction takes place between a chemical and the glove or other PPE material. Signs of degradation include:

- Cracking
- Blistering
- Swelling
- Discoloration
- Shrinkage

In *penetration* a chemical penetrates the PPE because of a manufacturing or design problem such as a tear or a separation in the material.

*Permeation* occurs when a chemical passes through the PPE barrier and comes in contact with the skin. Permeation happens at different rates depending on these factors:

- The thickness and type of PPE
- The concentration and type of contaminant
- Exposure conditions (temperature, humidity, length of exposure)

Glove Reuse

Allow reuse of gloves only if there is ongoing, specific testing for chemical decontamination at the site.
Employee Training

Even with proper selection of gloves, proper discard procedures, and proper testing for reuse, skin may still get contaminated. If employees take off gloves without cleaning the outside of the gloves, their skin will get contaminated. If they put the gloves on again, they will cause occlusion, which increases absorption of the contaminant.

Be sure to train employees in the following:

- How to don and doff PPE to prevent exposure
- Not to touch skin or their glasses with contaminated gloved hands
- How to clean their hands with proper cleaning solutions (D-Tam from CLI Labs) and then with soap and water
- That tools, surfaces, doorknobs, and light switches get contaminated and need proper cleaning as they serve as secondary exposure sources
- That they can use disposable covers for work surfaces
Preplacement and Periodic Medical Exams

Follow these guidelines related to employee preplacement and medical exams:

- Be sure employees who have preexisting skin diseases or allergies are aware of possible increase in exposure and absorption due to their pre-existing diseases (psoriasis, eczema). Also be sure these employees understand sensitization issues.

- Facilities where isocyanates are used should monitor employee exposure on a regular basis. A simple and convenient method is the use of dosimeter badges.

- Facilities where MOCA is used should provide quarterly biological monitoring for those handling MOCA. Urinalysis testing is the most effective method for identifying where exposures occur.
Summary

It should be clear that skin is an important route of exposure for both isocyanates and MOCA. Skin exposure and contact may lead to short- and long-term health effects. It can also lead to sensitization and, once sensitized, respiratory and skin signs and symptoms may be produced in affected employees at levels below TLV standards. Sensitization is usually permanent and sensitized employees need to be removed from any further exposure to isocyanates.

The best prevention against exposure is the proper and effective use of personal protective equipment. Using the right gloves and proper donning and doffing techniques are especially important. Employees need to watch out for permeation, degradation, and penetration of gloves and replace them at appropriate intervals. Employees who handle MOCA should be medically monitored on a regular basis.

Proper hand and skin protection are important safeguards for employees, but they can help improve productivity and minimize medical costs as well.
1. List three ways isocyanates can enter your body:
   
   (Answers:)
   • Inhalation
   • Skin contact
   • Eye contact

2. List the three possible short term health effects of isocyanate exposure:
   
   (Answers:)
   • Respiratory irritation
   • Skin irritation
   • Eye irritation

3. What are the two major possible long term health effects from isocyanate exposure?
   
   (Answers:)
   • Skin sensitization
   • Respiratory sensitization

4. What is one possible method of controlling isocyanate exposures in the workplace?
   
   (Answers:)
   Any one of the following:
   • Engineering controls
   • Proper work practices
   • Personal protective equipment
   • Personal hygiene
   • Housekeeping
Air and Surface Sampling

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Contents

Introduction
1. Sampling with a Detector Tube and Hand Pump
2. Collecting Long-Term Passive Samples
3. Outside Resources
4. Record Keeping
5. Surface and Skin Sampling
Appendix: Sources
Introduction

Inhalation and skin contact are the major ways isocyanates can enter the body. Skin is the major route of entry for MOCA as well. Whenever you handle MOCA or isocyanate-contaminated surfaces, you expose yourself to these chemicals. If you lean over materials being made from isocyanates or fail to use ventilation, you also expose yourself to these chemicals and their hazards.

Air sampling determines whether effective engineering controls and work practices are in place. Skin sampling lets you know whether your personal protective equipment (PPE), especially your gloves, are effective. Surface sampling lets you know whether housekeeping in your work area is adequate.

The material that follows describes different sampling methods. It discusses short-term detector tube sampling, long-term passive tube and badge sampling, surface and skin sampling, working with laboratories and equipment, and the important processes of documenting and interpreting results.
1. Sampling with a Detector Tube and Hand Pump

As an initial step in evaluating an atmospheric hazard, collect a detector tube sample with a hand pump. While detector tube sampling may appear simple, it is important to use the proper equipment and methods. This section describes the process. It tells you what to consider every time you collect a detector tube sample and how to document your results properly.

Method and Limitations
Detector tubes give you a rough estimate of an airborne contaminant concentration. They are usually area, not personal, samples and they are instantaneous (not an average concentration over a period of time). The principle behind detector tubes is simple. A hand-operated pump draws air through the tube. The tester squeezes the pump closed and then releases it. Springs inside the bellows cause them to expand, pulling the same volume of air through the tube with every stroke. The tube contains chemicals that react with a specific air contaminant. The color of the chemical within the tube changes. You can read the approximate air concentration by using the scale on the side of the tube.
**Method and Limitations continued**

The accuracy of tubes varies from $\pm 10\%$ to $\pm 40\%$ depending on the tube used and conditions in the area sampled. For example, if you are using a tube that is accurate to within $\pm 30\%$ and your reading is 500 ppm, then the actual (real) concentration of the contaminant in the air is somewhere between 350 ppm and 650 ppm. This is because 30% of 500 is 150 so the concentration falls between $500 \pm 150$ ppm. If the permissible exposure limit (PEL) for the contaminant is 100 ppm, then even this rough estimate lets you know that the area is out of compliance.

The instructions that accompany each detector tube tell you how many pump strokes achieve the required air volume for each tube.

**Limitations**

Various manufacturers make detector tubes and pumps. Use only one brand of tubes and pumps together. Do not use tubes from one manufacturer with a pump from another—this will result in incorrect readings.

**Other Limitations**

- Use tubes within the temperature range specified in the instructions. The chemical reactions within the tube will not proceed at all temperatures.
- Do not use tubes beyond the expiration date on the package.
- Be aware that the tube may detect chemicals other than the one you are monitoring. These chemicals may interfere with your monitoring, so check to see if these chemicals are present where you are testing.
- Be aware that the end of the color change may extend over a range and be difficult to assess. In these cases record the reading as a range.
Procedures for Use
This procedure is for Drager™ pumps and tubes, but the approach is similar for other brands. Follow the manufacturer’s instructions included with your pump.

1. Test the bellows pump for leaks by inserting an unopened detector tube into the tube holder and depressing the bellows pump completely. If the pump is leakproof, it should remain depressed after half an hour. Read the pump instructions for more information on leak testing.

2. Select detector tubes appropriate for the materials you are sampling. Check cross-reactivities listed in the tube instructions to see if more than one material in the sampling area will cause the color of the tube to change. For example, ammonia tubes will change color in the presence of gases such as organic amines.

3. After reading the tube instructions, break off the ends of the tube and insert it into the pump. Squeeze the pump for the number of strokes required. When squeezing the bellows closed make sure they are straight and depressed all of the way. Using two hands may make this easier. Allow the pump to fill entirely before depressing it again.

4. Read the tube to determine how much of it has changed color. You may find the end of the color change hard to assess. In this case, note a range instead of a single number. Record the concentration on the detector tube log sheet along with the date of sampling and a brief description of the operations and the employee activities in the vicinity of the sampling location.
Applications at Your Facility
Use detector tubes when estimating airborne contaminant levels from certain operations including:

- Carbon monoxide produced by forklift combustion engines and heaters
- Organic vapors from solvents, thinners, and mold release agents
- Isocyanates

You can use detector tubes with a hand pump to check for a number of contaminants. Most companies that make these systems (Drager is the best known) publish a handbook that tells about available tubes and what substances will cross-react with them.
2. Collecting Long-Term Passive Samples

Without using battery-operated pumps, you can collect long-term samples in two ways: passive tubes or passive badges. Passive means the method does not use a pump to move air through the sampling media. The device simply sits out in the open and gradually absorbs contaminants from the surrounding air. You can use passive methods to collect gas and vapor samples for many operations. This module describes passive sampling and how to apply these methods at your plant.

**Long-Term Passive Detector Tubes**

Use this special type of passive tube for either personal or area samples. Contaminants diffuse into an empty area inside the tube and then into the absorption media. The contaminant reacts with the chemicals in the tube and causes a color change. The driving force behind such tubes is that air containing a higher concentration of a contaminant naturally moves into an area of lower concentration, in this case, the empty area inside the tube.

These tubes indicate concentration by changing color along their length. You must record in minutes the length of time they are open for sampling. You can use detector tubes to find concentration averages over long periods of time as stated on the instruction sheets. Use most passive tubes for four- to ten-hour samples.
Limitations
The limitations for passive tubes are essentially the same as the limitations for detector tubes with pumps:

- They function correctly only between given temperatures.
- They do not function correctly after their expiration date.
- Other contaminants may cause the color in the tube to change.
- They are accurate only within a range of certainty.
- If the size and shape of the opening on the tubes is too small or too large, the tube will not function correctly.
- Workers must securely attach the sample so it does not fall off into moving machinery. The clip-on badges or tube holders must be strong and workers must clip them on where they will not rub against anything. Tape down unstable samples with duct tape, but do not cover the sample face or orifice in any way.
How To Use Passive Detector Tubes

1. Go to the area or person to be sampled.

2. Mark the tube with a sample number.

3. Open each tube by breaking the correct end off. Be sure the openings in the ends of the tubes are at least one-half the diameter of the tube.

4. Record the exact time when you break off the end and record the number of the tube. (This is assigned by you.)

5. Insert the tube into a holder and hang it at about breathing height in a safe place in the work area or hang it from the collar of a worker in the area using the clip attached to the holder.

6. After sampling is finished, record the stop time.

7. Read the color change area in the tube using the scale on the side of the tube. Follow the tube instructions to calculate the actual average air concentration.
Passive Badges
These badges operate on the same principles of diffusion as the passive tubes. Most badges do not provide instantaneous readouts with color changes. Instead, you place the badge in a sealed container and send it to a laboratory for analysis. Laboratories remove or desorb the chemical of interest from the badges and analyze its quantity using special techniques.

You can use badges for short-term exposure measurements (to verify compliance with STELs), but they are usually used for long-term sampling — from four to ten hours.

Follow the instructions that come with the badges for correct operation.

Limitations
- Badges have a limited shelf life, so check the expiration date on all badges to be sure they have not expired.
- They are not highly accurate.
- They may fall off.
- Temperature, humidity, and air movement affect how well they work.
- Passive badges collect only selected gases and vapors.
GMD Badges
Using GMD’s Sure-Spot badges is a simple way to monitor isocyanate exposure. These badges are clipped to your collar and sample your breathing zone.

The badges are designed to be worn during the entire work period. After the work period a direct measurement of TDI exposure is determined. These results must be recorded in a documentation form.

The materials needed to perform monitoring are contained in the Sure-Spot badge kit (badge holder, TDI or MDI badge card, and the Dose Estimator Card).

Follow these steps to perform proper isocyanate monitoring.

1. Check the badge holder unit to make sure all parts are in place. The plastic sampling tube on the top of the badge should fit snugly in place.

2. Remove a badge card from the sealed pouch. Check the expiration date on the card. If it is past this date, do not use the card. **Do not open the sealed pouch until you are ready to begin sampling.**

3. **NEVER** reuse a badge card. These cards are only good for one shift (8 hours).

4. Record the badge number (printed on the badge card) and your name in the log.

5. Fill in the remaining appropriate information on the back of the card and in the log.

6. **Always** be sure to record the start time and stop time. This is very important.
GMD Badges continued

7. Remove the barrier strips on the badge card and properly place the card into the holder.

8. Close the flaps of the holder. If they do not close easily, the card has not been inserted properly.

9. Make sure the Control (top) and Indicator (bottom) windows are exposing the tape on the badge card.

10. Clip the holder to your collar.

11. Observe the bottom window for any color change. Report any color changes immediately to your supervisor.

12. Exposure to sunlight may cause the white background of the TDI badge card to take on a yellow tint. This will not interfere with the test.

13. At the end of the shift, remove the badge card from the holder and record the stop time on the back of the badge card and in the log.

14. Fit the badge card into the back of the Dose Estimator. Make sure the CONTROL window is on top and the INDICATOR window is on the bottom.

15. Rotate both color wheels to the best color matches. Read the number of both windows. Record these numbers under the Dose column. C = Control and I = Indicator on the log.

16. Use the higher of the two readings (C or I) to determine the dose (in ppb-hrs) from the Dose Estimator Card. Record this number on the log.
3M Badges
The following are general instructions for badges manufactured by 3M™. The company makes different badges for solvents and formaldehyde exposure.

1. Take the badge out of the can. Leave the lid for the badge in the can.

2. Record the following information on the can lid and monitoring log:
   a) The serial number of the monitor
   b) The sampling date
   c) The employee’s ID or area monitored
   d) The temperature and humidity of the sample area. (Obtain humidity information from the nearest airport weather station.)
   e) The contaminants to be analyzed

3. Write the start time on the back of the monitor and on the log.

4. Hang the badge on the collar or near the breathing zone of the worker.

5. When sampling has ended, remove the white film and the plastic ring holding it in place from the front of the badge.

6. Firmly snap the cover on to the badge and plug ports with the port plugs on the cover.

7. Record the end time on the back of the badge and on your sample log.

8. Place the badge in its can and mail it to the lab for analysis.

   For blanks, proceed directly through all steps skipping steps 3, 4, and 7.
Applications for Passive Tubes and Badges at Your Facility

Use passive monitoring to obtain a rough estimate of airborne contaminant levels. If compliance is in question, or for confined spaces entry or other potentially dangerous situations, use more exact sampling techniques as directed by an industrial hygienist.

Passive methods are the easiest to use. They do not require calibration and are easy for workers to wear because they do not require an air pump. You may use these devices when exact measurements of air contaminant levels are not necessary.

Check with your supplier for other tubes and badges that may be useful at your facility.
3. Outside Resources

This section describes how to work with outside resources that support your sampling efforts and some of the basic decisions that are part of the sampling process.

Talking to the Laboratory
A laboratory usually provides free sampling media that is returned later by your facility for analysis. The laboratory will preweigh certain types of filters in order to provide information on the total weight of the sample collected.

All industry facilities should locate and use an American Industrial Hygiene Association Accredited Laboratory for air-sampling purposes. The lab does not need to be close to the facility because samples are easily sent through the mail.

The laboratory is a sampling resource. Any good lab will have a technical staff available to answer your sampling questions. The staff can tell you which type of sampling media to use and whether it is possible to sample different materials using the same tube. For example, you can sample some alcohols (such as isobutyl alcohol) and some aromatics (such as xylene) in the same tube. They will tell you what flow rate to use and how many liters of air to draw through the sampling media. They may advise you on reactivities from other materials in your sampling area.
Talking to the Laboratory continued

Always call the laboratory before you collect a sample that requires analysis. Even professionals call before sampling to ensure they are using the most current methods and to ask for advice and directions.

Your analysis laboratory is an important resource. If the technical support from the laboratory you are using seems insufficient, look for another lab. Make sure you tell the lab the exact date you need sampling media — labs will rush order the media if required. Some sampling media expire quickly, so do not order them too far ahead of time.

Decide on the number of tubes and cartridges ordered based on the following:

- The number of workers in the area
- The number of samples you need to accurately represent work area conditions
- Whether you should use area samples

Use area instead of personal samples when:

- Workers are in tight places or awkward positions that make it difficult for them to wear a personal sample all day. Sampling equipment or media may fall off of a worker.
- An area sample at a single operation gives you an idea of how much the operation contributes to the overall air contaminant levels.
Blanks

A blank is a media sample that is not exposed to contaminated air or attached to a sampling pump. It is simply opened, recapped, and sent in to the lab as a control for the sampling media. The lab analyzes the blank for each contaminant tested to show how much of that contaminant was on the tube before sampling was started or was picked up in shipping and handling. These results are subtracted from the sampling tube of the same media sent in with the blank.

Always remember to request enough samples to have a blank for each type of media you use.

- Have one blank for each batch of media (media tubes and cartridges are prepared in batches, usually designated by a lot number on the media tube or cartridge). Batches differ slightly in composition.
- Have a blank for each type of media used or each sampling session. A session may last a day or a series of days. Only one blank per media type is included per session unless media used in the session is from different batches.
Renting Sampling Equipment
Air-sampling equipment is often expensive. Because most facilities conduct monitoring for brief, intermittent periods, equipment is often rented. The equipment rental facility you use should also provide technical support. When you are in the field and you have a problem with an instrument, it is important to have a technical support person available to assist you by phone. A good rental facility is a valuable resource and can save you a lot of time.

Determining Equipment Requirements
Use the following to determine what equipment you need:
- The material you are sampling
- Whether you need an instantaneous readout, a log over time, or neither of these
- Which rented air pumps are appropriate for the sampling media you are using

Filter cartridges and impingers usually require high-flow pumps while glass absorbent tube samples usually require low-flow pumps. You can convert high-flow pumps into low-flow ones using tube holders with flow restrictors, which you can rent with the pumps.

Explain to the rental company what you want to monitor and they will help you choose the right equipment.

Make sure you know how long battery-operated equipment will hold a charge. You must let most battery-operated instruments run down completely before recharging them.

Read the operating instructions before using sampling equipment. Call the rental company for operating directions if you need it. It's part of their service.
Calibration
When you rent monitoring equipment, you also need to rent calibration equipment. Almost all equipment requires calibration to function correctly.

To calibrate an air pump, you will need to rent an external flow meter to read the flow rate of a pump. Adjust the flow on the pump to the appropriate rate for the sampling media.

Electronic continuous-monitoring equipment is calibrated by hooking it up to one canister of gas containing none of the monitored gas to establish the zero setting of the instrument. Sometimes clean room air is used, depending on the instrument. Another canister containing the monitored gas calibrates the instrument response to a known concentration. Adjustments are made on the Zero and Span knobs respectively to set these two values. These settings affect all of the readings an instrument records, so make them immediately before you begin sampling.

Careful calibration is crucial for achieving accurate results.
Industrial Hygienists

Industrial hygienists (IHs) are professionals who are trained to conduct sampling and assess work environments for hazards including airborne contaminants. They follow up assessments with advice on how to protect workers from hazards in the workplace. Your facility may employ industrial hygienists or bring them in as consultants.

Industrial hygienists deal with equipment, regulations, and health and safety questions every day. They can save time and money by conducting monitoring for you or by assisting you with advice or training. It is worthwhile to locate an industrial hygienist to assist you with work related to OSHA compliance and worker health and safety.

An industrial hygienist in training (IHIT) is a degreed individual who has passed one of two difficult, full-day examinations towards becoming certified by the American Industrial Hygiene Association (AIHA). A certified industrial hygienist (CIH) has passed both of these exams and has worked in the field, or had related experience, for at least five years.
4. Record Keeping

OSHA requires you to keep accurate records of your sampling. This section explains why and how to correctly document your samples.

Documenting Sampling Methods

When you conduct sampling, record the following information:

- The instrument make and model
- The instrument serial number or number put on the instrument by the rental facility
- The flow rate (if applicable)
- The material(s) sampled with the instrument
- The calibration technique used and when calibration was done (if applicable)
- The type of sampling media used (3M badge, GMD badge)
- The sampling location
- The date
- The name of the person conducting sampling
Documenting Sampling Methods continued

Record the following information for each individual sample taken:

- The sample number (if applicable). This number or letter is usually assigned by you and written on the sample with an indelible marker or wax pencil
- The instrument serial or identifying number
- The start and stop times for all samples that are not instantaneous. (Use military time—twenty-four hours instead of twelve hours. For example 3:00 in the afternoon is 15:00.)

Documenting Results

Data loggers usually provide computer printouts. Summarize the logged data in a graph or as an eight-hour time-weighted average (TWA) if the instrument or computer software can do so.

Photocopy and attach lab results to the sampling log.
5. Surface and Skin Sampling

Surface sampling determines whether skin or equipment has become contaminated with isocyanates or MOCA and confirms successful decontamination. Breakthrough indicators and Swype tests are two methods you can use to see whether contamination exists.

**CLI Swype Tests**

A Swype test is a quick, reliable method used to verify decontamination. Use a Swype that is appropriate for the chemical you are testing. Different Swypes are needed for detecting MOCA and isocyanate contamination.

Clean tools and equipment with an appropriate decontamination solution such as CLI's D-Tam. After cleaning, use Swype tests to confirm decontamination. Spray with solution as directed by the manufacturer. Then wipe Surface Swypes across the equipment and analyze it in the field. A color change indicates chemical contamination. Also perform Swype tests after spill cleanups to confirm decontamination.
Contamination/Decontamination Cycle
CLI Breakthrough Indicators

CLI’s underglove detectors provide a way to determine if a chemical has penetrated your protective clothing, typically your gloves. Solvents can penetrate through your glove and create a hazardous exposure because warm and wet conditions increase skin’s absorption potential. Choosing effective gloves is difficult and gets more complex when more than one chemical is present.

The underglove detectors are similar to band-aids and are worn, rather than simply wiped over the skin’s surface. Place underglove detectors on the thumb, middle finger, and the palm. A color change after activation indicates the gloves are leaking.

Cleanse skin with D-Tam solution prior to using Permea-Tec Breakthrough Indicators. Follow the manufacturer’s instructions under the direction of an industrial hygienist.
Appendix: Sources for Sampling and Decontamination Supplies

Sampling Equipment
Equipment to monitor for isocyanate exposures is available from:
- GMD Systems, Inc.
  625 Alpha Drive
  Pittsburgh, PA 15238
  (412) 963-2020

GMD supplies Sure-Spot Color Badges, an inexpensive and easy method of determining daily worker exposure. GMD also has equipment available to perform periodic or continuous area sampling of isocyanate levels.

Decontamination Supplies
Solutions specifically designed to decontaminate surfaces, skin, and equipment are available from:
- Colormetric Laboratories, Inc. (CLI)
  1261A Rand Road
  Des Plaines, IL 60016
  (708) 696-3036

CLI provides D-TAM Cleaning Solution to decontaminate skin of MOCA and isocyanates. Aromatic Amine Decontamination Solution can be purchased to decontaminate work surfaces and equipment from MOCA contamination. Isocyanate Decontamination Solution is available to decontaminate work surfaces and equipment from isocyanate contamination.

CLI provides Swypes™, which can be used to confirm proper decontamination. Permea-Tec underglove detectors are also available from CLI.
Decontamination Supplies
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CLI provides Swypes™, which can be used to confirm proper decontamination. Permea-Tec underglove detectors are also available from CLI.
# COMPLIANCE SAMPLING RECORD

**FACILITY:**

**NOTES (EQUIPMENT, CALIBRATION METHOD, LABORATORY USED, DETAILS ON OPERATIONS TESTED):**

<table>
<thead>
<tr>
<th>Date</th>
<th>Sample number</th>
<th>Material Sampled</th>
<th>Person Wearing Sample or Area Where Sample Taken</th>
<th>Activities in Sample Area, Other Notes</th>
<th>Start rate, LPM</th>
<th>End rate, LPM</th>
<th>Start time</th>
<th>Stop time</th>
<th>Total vol., Liters</th>
<th>Result Include units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>Sample Method Used - Media, lot number, pump, other equipment. Remember to include a blank.</td>
<td>Your initials</td>
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</table>

Sampled by ____________________________
## DETECTOR TUBE/HAND PUMP SAMPLING RECORD

**FACILITY:**

**NOTES (EQUIPMENT, METHOD, DETAILS ON OPERATIONS TESTED):**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Material Sampled</th>
<th>Where Sample Taken</th>
<th>Pump Strokes</th>
<th>Result Include units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Tube Used - Brand, Type, Serial and Part Number Expiration date. Remember to use same brand of pumps and tubes.</td>
<td>Your initials</td>
<td>Activities in Sample Area, Other Notes</td>
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</tbody>
</table>
# DIFFUSION TUBE/BADGE SAMPLING RECORD

**FACILITY:**

**NOTES (EQUIPMENT, CALIBRATION METHOD, DETAILS ON OPERATIONS TESTED):**

<table>
<thead>
<tr>
<th>Date</th>
<th>Sample number</th>
<th>Material Sampled</th>
<th>Person Wearing Sample or Area Where Sample Taken</th>
<th>Activities in Sample Area, Other Notes</th>
<th>Start time</th>
<th>Stop time</th>
<th>Total time</th>
<th>Control</th>
<th>Indicator</th>
<th>Result Include units</th>
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*Sampled by* ____________________________________________________________

PMA — Compliance Sampling Record
Lockout/Tagout

Theodore J. Hogan & Associates, Inc.
8330 S. Madison, Suite 20
Hinsdale, IL 60521
708/325-3939
Lockout/Tagout

Lockout/tagout is covered by OSHA Regulation 29CFR 1910.147. This standard is designed to protect employees from injury while repairing and maintaining machines and equipment that could start up or release energy unexpectedly. Electrical, air, pneumatic, hydraulic, steam, and other energy releases can cause injury.

Protect employees by ensuring all controls are in the off or safe position and a lock is on the controls before any work begins. Each employee will have a key for his or her own lock. Not all controls can be locked, however. When controls cannot be locked, use a tag to warn others not to start the equipment.
Lockout/Tagout Administration

A supervisor administers the lockout/tagout program.

The supervisor should:

- Make sure that workers follow safe practices at all work areas
- Review and approve all purchases of equipment for the program
- Ensure that there is a place for locks on new or overhauled equipment
- Perform a yearly audit of the lockout/tagout practices in each work area
- Perform job safety analyses (JSAs) or other analyses for each type of equipment in the work area and prepare specific lockout/tagout procedures for each piece of equipment
- Train all employees in correct lockout/tagout procedures and document which employees have been trained
- Give each employee locks and tags and make sure the employees are following procedures correctly
- Enforce lockout/tagout by immediately stopping work on equipment that is not properly locked out or tagged out

Employees must lock out or tag out any piece of equipment they are working on that could injure them by an unexpected energization, start-up, or release of energy. Alert employees in the work area to hazardous situations and ensure that they follow proper lockout procedures. Individuals must place and remove their own locks. They are responsible for their own safety. No one else may place or remove a lock.
Lockout/Tagout Procedures

Each type of equipment, machine, and process used by your company needs specific procedures for the control of hazardous energy. Supervisors must perform job safety analyses (JSAs) for each type of equipment in their departments. A copy of a job safety analysis with instructions is attached. The JSA covers all of the steps listed in the procedure for lockout/tagout that follows.

1. Identifying when you need to lockout or tagout
Use lockouts whenever workers repair or maintain equipment that could cause injury by an unexpected start-up or release of stored energy. This includes times when workers remove guards or other safety devices or when moving machinery could catch part of a worker's body. Use lockouts or tagouts when employees repair electrical circuits, clear jammed mechanisms, or clean or oil machinery with moving parts.

2. Preparing for shutdown
   - Notify all employees at the job-site to use a lockout system on the equipment.
   - Identify all sources of energy supplying the system, the types of hazards they present, and how to control them.

3. Shutting down equipment
   - Shut down equipment that is operating using the normal means.
   - Be sure to follow the correct procedure for each piece of equipment.
Lockout/Tagout Procedures, Cont.

4. Isolating equipment
   - Operate (shut down) the switch, valve, or other energy-
     isolating device, so that the equipment is isolated from its
     energy sources.
   - Be sure to isolate both secondary and primary energy sources.

5. Applying lockout/tagout devices
   - Place a lock on each energy-isolating device. Employees will
     need a lock for each device they lock out.
   - See that an identifying tag with the name of the person who
     placed the lock accompanies each lock used.
   - Ensure each employee places his or her own lock or tag.
   - If tags are used instead of locks, instruct workers to attach
     them with molded nylon lock straps as close as possible to
     the point where they would place a lock.
   - Be sure each employee adds the following information to the
     approved tags:
     - Employee's name
     - Date the tag was applied
     - Warning of the hazardous condition

6. Controlling stored energy
   - Release or restrain stored energy by blocking, bleeding down,
     repositioning, or other effective methods.
   - If it is impossible or impractical to lock out or tag out a piece
     of equipment, call in a qualified person to make the equip-
     ment safe for maintenance. The qualified person may discon-
     nect wiring, remove fuses, uncouple drive shafts, remove
     belts, or use other means to control energy. Be sure to place
     danger tags to describe the condition.
Lockout/Tagout Procedures, Cont.

7. Verifying isolation of equipment
   - Check to make sure no employees are exposed to dangerous areas.
   - Verify that all the energy sources, including the main disconnect switch or circuit breaker, are disconnected.
   - Operate the start buttons and other equipment controls to make certain the equipment will not operate.
   - Return all operating controls to their neutral or off position after completing the test.

8. Doing the work
   - Do not do anything that could restart the equipment.
   - Do not bypass the lockout when putting in new wiring or piping.

9. Shift or personnel change
   - If work is not completed by the end of a shift, locks and tags must remain in place until the job is completed.
   - If an employee is replaced, the incoming employee must attach a lock or tag as the outgoing employee removes his or hers.
   - Be sure not to interrupt lockout/tagout protection.

10. Removing locks and tags
    - Do not remove locks or tags until the job is completed.
    - Clean up all rags, tools, and materials used in the work.
    - Replace the guards on machines and equipment.
    - Conduct a head count and check to make sure that all employees are in a safe position.
    - Notify everyone affected that the lockout or tagout device is being removed.
    - Each employee must remove his or her own lock or tag. This is the key step for preventing injuries and is an OSHA requirement.
Lockout/Tagout Procedures, Cont.

11. Temporary removal
Follow all of the above procedures to temporarily remove and replace locks and tags when you test the equipment. This means you must go through the steps for removal of the tag and do the test, then prepare for shut down, shut down, isolate, apply locks, control energy, and verify isolation of equipment.

12. Emergency removal
Only a supervisor, in the presence of an employee, can perform emergency removal of another employee's locks and tags. The following conditions must apply:

- After making a reasonable effort to contact him or her, the supervisor must verify that the employee who put the lock or tag on the equipment is not at the facility.
- Inform the employee that his or her protective device was removed before he or she resumes work. This can be done by attaching a tag to the employee's time card.
- Supervisors must prepare a report explaining why the protective device was removed, when and where it occurred, and how the affected employee was informed prior to restart of work.
- Because the employee has the only key to the lock, the supervisor will have to cut the lock off and supply a new lock and key to the employee as soon as possible.
Periodic Inspection
The supervisor conducts an annual inspection of each work area’s use of this program. The inspection consists of a review of work practices, deviations from procedures, corrective actions taken, reviews of the use and limitations of tags with employees, and certification of the inspection by an authorized employee.

Checklist for Lockout/Tagout
1. List the person or persons responsible for administrating the lockout/tagout program.

2. Identify the areas, equipment, and activities where your company requires lockout and tagout. The job safety analysis for each job or piece of equipment is very helpful.

3. Authorize an employee (such as a member of the safety and health committee) to perform an annual inspection of the lockout/tagout program. Keep records of this inspection on file.

4. Train all employees in proper lockout/tagout procedures and document the training.

5. Distribute a copy of the following step-by-step checklist to all employees who perform lockout/tagout. The person performing the lockout/tagout should initial each step. This ensures all the proper steps are taken.
LOCKOUT TAGOUT CHECKLIST AND SPECIFIC EQUIPMENT PROCEDURE

1 Identify the Piece of Equipment To Be Locked Out/Tagged Out
   Facility ___________________________ Equipment ___________________________

2 Preparing for Shutdown
   I have notified all affected employees that a lockout is going to be used.
   Persons notified ___________________________

3 Shutdown
   I have shut down equipment by normal operating means.
   Means of shutdown ___________________________

4 Isolation, Release of Stored Energy, and Lockout/Tagout Device
   I have identified and isolated all of the sources of energy. Includes electrical, mechanical, hydraulic, chemical, and thermal sources. I have determined the proper isolation sequence. I will check for stored energy and consider what may happen when energy is released.

<table>
<thead>
<tr>
<th>Source of energy</th>
<th>Hazard</th>
<th>Isolation or release method and L/O</th>
</tr>
</thead>
<tbody>
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   I have released or blocked all stored energy by an appropriate method (grounding, blocking, bleeding, repositioning, or other method). Initials ___________________________

   I have applied a lockout/tagout device to each piece of equipment requiring it. Initials ___________________________

5 Verifying Isolation
   I have verified the isolation of equipment by making sure all employees are clear of danger and all energy sources are disconnected, operated the start buttons to confirm all equipment will not operate, and returned all controls to the off (or safe) position after verification.

   Power sources tested ___________________________ Returned to off or safe position ___________________________

6 Removing Locks and Tags
   All locks and tags remained in place until the job was completed. If a new shift began and someone else was going to work on the equipment, I removed my lock and tag and another employee placed his or her lock and tag on the equipment.

7 Ending Lockout/Tagout
   I have completed the work, cleaned the area, replaced all guards on machines, notified all employees the lockout/tagout devices are being removed, and removed my own lock and tag.
   Date ________________ Time ________________ Initials ___________________________

8 Temporary Removal
   If temporary removal of a lock or tag is required, I have repeated all the requirements in steps 1 through 5.
   Date ________________ Time ________________ Initials ___________________________

9 Emergency Removal
   There was an emergency removal of a lock and tag by the supervisor in the presence of another employee and the employee whose lock was removed was notified.
   Date ________________ Time ________________ Supervisor Initials ___________________________ Employee Initials ___________________________
Hearing Protection

Theodore J. Hogan & Associates, Inc.
8330 S. Madison, Suite 20
Hinsdale, IL 60521
708/325-3939
HEARING PROTECTION

Excessive noise damages hearing. Hearing loss can occur slowly over a long period of time and the affected person may be unaware of the damage. In order to prevent hearing loss, employees should protect their hearing at all times, both at work and outside the workplace.

OSHA has a standard for protecting hearing in the workplace. It is in OSHA regulation 1910.95.

Determining the Noise Level
Noise is monitored to determine the noise levels in the workplace. A noise dosimeter or a sound pressure meter is used to make noise measurements. The decibel is the unit of measurement of sound, and the A-weighted decibel scale is used to determine OSHA compliance.

Acceptable Noise Levels
In order to maintain OSHA compliance, the noise level cannot exceed ninety decibels on the A-weighted scale (dBA) for an eight-hour, time-weighted average (TWA). If the noise level exceeds 90 dBA, you must implement appropriate administrative or engineering controls. The OSHA action level is 85 dBA. If any employee has a noise exposure that equals or exceeds an 8-hour TWA of 85 dBA, then a hearing conservation program is mandatory.
Controlling Noise Levels

An administrative control for protection against noise is rotation of workers to reduce their time spent in noisy work areas.

Engineering controls include reducing the noise level by using barriers, isolating equipment (covering the noise source), or replacing noisy equipment.

Be sure to monitor any new or additional equipment used at the company and incorporate engineering controls into the equipment prior to use.

If administrative and engineering controls do not reduce noise to an acceptable level, OSHA requires workers to use personal protective equipment.
Hearing Conservation Program

If the OSHA action level of 85 dBA (TWA) is exceeded, a hearing conservation program is mandatory.

A written hearing conservation program should include the following:

- Designation of the person responsible for administrating the program
- Noise monitoring
- Audiometric testing
- Employee notification of noise monitoring and audiometric results
- Hearing protection
- Employee training
- Enforcement of the program
- Recordkeeping
- Posting of signs in areas requiring hearing protection
- Periodic inspection of noise levels and the hearing conservation program

The following sections describe each of these items in more detail.
Program Administrator
One person is responsible for administrating the hearing conservation program. The administrator:

- Oversees the program
- Ensures that hearing protection is available
- Arranges for noise monitoring and audiometric tests
- Reviews the program on an annual basis

Additional persons may assist in administrating and enforcing the program. Supervisors or safety committee members may:

- Provide employee training
- Ensure employees wear hearing protection in required areas
- Post notification in areas requiring hearing protection
- Check that employees wear their hearing protection properly

Noise Monitoring
Conduct personal or area noise monitoring to determine which areas have noise levels above 85 dBA for an eight-hour shift. Area monitoring identifies work areas where hearing protection is required. Personal noise monitoring determines which employees to include in the hearing conservation program.

Noise monitoring is important in determining which type of hearing protection will best protect hearing.

Inform all affected employees of monitoring results.
Audiometric Testing

All employees included in the hearing conservation program must be given a baseline audiogram within six months of an exposure to noise at or above 85 dBA.

An audiogram is a chart, graph, or table resulting from an audiometric test that shows an individual's hearing threshold levels as a function of frequency.

New audiograms are compared to the baseline audiogram to determine if hearing loss has occurred.

The annual audiogram is compared to the baseline audiogram to determine if there is a standard threshold shift (STS). An STS is a change in hearing threshold relative to the baseline audiogram. A change is denoted by an average of 10 dB or more at 2000, 3000, and 4000 hertz in either ear.

A licensed or certified audiologist, or a physician or technician who is certified by the Council of Accreditation in Occupational Hearing Conservation, must perform the audiogram.

All employees in the hearing conservation program must have an annual audiogram with the appropriate follow-up as required by the OSHA standard.
Employee Notification of Noise Monitoring and Audiometric Results

Notify all affected employees of personal and area monitoring results.

The audiometric tester should explain the results of the audiogram to each employee. Any employee whose audiogram indicates an STS has occurred may obtain a retest within thirty days. You can use the results from the retest as the annual audiogram for that employee.

If the comparison of the annual audiogram to the baseline audiogram indicates an STS has occurred, you must inform the employee in writing within twenty-one days of the determination.

If a physician determines the standard threshold shift is work related then you must take the following steps:

- If the employee is not currently wearing hearing protection, fit the employee with protectors and train him or her in their use and care.

- If the employee is already wearing hearing protection, refit the employee with protectors that have a higher attenuation and retrain him or her in the proper use.

- If wearing the hearing protection itself causes or aggravates the problem, refer the employee for a clinical audiological evaluation.

If subsequent audiometric testing of an employee indicates that an STS is not persistent, you must inform the employee of this.
Hearing Protectors

Employers must:

- Supply hearing protection at no cost to all employees in the hearing conservation program
- Replace hearing protection as necessary

Any employee who is exposed to an 8-hour TWA of 85 dBA or greater, and who has not yet had a baseline audiogram, must wear hearing protection.

Employees should give workers the opportunity to select hearing protection from a variety of types with the proper attenuation.

Employee Training

Train all employees in the hearing conservation program on an annual basis. The training must include:

- The effects of noise on hearing
- The purpose of hearing protectors
- The advantages, disadvantages, and attenuation of different types of protectors
- Proper selection, fit, use, and care
- The purpose of audiometric testing and an explanation of the test results

Booklets or videos are useful tools for employee training. It is very important for all employees to learn how to properly wear hearing protection. If protectors are not worn correctly, they will not protect the wearer’s hearing. Proper care is also important to prevent ear infections or other complications.
Enforcement of the Program

Enforce the hearing conservation program firmly and consistently. The supervisors or members of the safety committee are responsible for enforcing the use of hearing protection in required areas.

All persons in hearing protection areas should wear hearing protection devices including visitors, managers, and office employees. Consistency in applying the rule reinforces the use of hearing protection.

It may be necessary to develop a disciplinary procedure to enforce the use of hearing protection devices in required areas. At the same time, it is important for the program administrator, supervisors, or safety committee to respond to employee problems or complaints.

Recordkeeping

Keep records of noise measurements and audiometric testing:

- Retain noise measurements for two years.
- Keep audiometric test records for the duration of the employee’s employment.

Audiometric test records must include:

- The name and job classification of the employee
- The date of the test
- The audiometric examiner’s name
- The date of acoustic calibration
- Measurements of background sound pressure levels in audiometric test rooms.

OSHA requires employers to report all work-related standard threshold shifts with an average of 25 dB or more at 2000, 3000, and 4000 hertz (Hz) in either ear on the OSHA 200 log.
Posting of Signs
Follow the guidelines below:

- Post signs at the entrance to all areas where the noise levels exceed 85 dBA.
- Signs should read *Hearing Protection Required Beyond This Point* or the equivalent.
- Post signs in English and Spanish if necessary.
- Post signs on noisy equipment or in areas where hearing protection is required.
Periodic Inspection

Evaluate the hearing conservation program's effectiveness on an annual basis.

Address the following issues during the evaluation:

- Monitoring
  - Areas monitored in previous year
  - Areas that require monitoring for next year
- Audiometric testing
  - Areas/employees participating
- Any hearing loss from last year
  - What caused the hearing loss
- Hearing protection
  - Not being worn?
  - Not being worn properly?
  - Insufficient protection?
- Noise sources
  - New sources
  - Old sources that have become louder
- Actions to take
  - Fix noise sources
  - Conduct additional training
  - Use different hearing protectors
  - Enforce the use of hearing protection
Checklist for Hearing Protection

1. Have you performed noise monitoring to determine noise levels in the work area?

2. Have you recorded the monitoring results?

3. Do the monitored noise levels exceed the established OSHA limits?

4. Have you applied engineering or administrative controls to reduce noise levels below the OSHA compliance and action levels?

5. Are employees exposed at or above 85 dBA for an 8-hour TWA?

6. Does your company have a hearing conservation program?

7. Does the hearing conservation program include the following:
   - A written plan
   - A program administrator
   - Noise monitoring
   - Audiometric testing
   - Employee notification of noise monitoring and audiometric results
   - Providing hearing protectors
   - Employee training
   - Enforcement of the program
   - Recordkeeping
   - Posting of signs
   - Periodic inspection

8. Who is the administrator of the program?

9. Who performs noise monitoring and how frequently?
Checklist for Hearing Protection, Cont.

10. Are all employees in the hearing conservation program provided a baseline and an annual audiogram by a qualified person?

11. Are employees notified of the noise monitoring and audiogram results?

12. Did any employees experience standard threshold shifts?

13. Do you provide various types of hearing protection to those employees required to wear them?

14. Are employees trained on an annual basis on hearing protection? Are they taught the proper selection, fit, use, and care of hearing protection?

15. How do you enforce the hearing conservation program?

16. Do you maintain all noise monitoring records for two years?

17. Do you maintain all audiometric records for the duration of employment for each employee?

18. Do you report all standard threshold shifts with an average of 25 dB or more at 2000, 3000, and 4000 hertz in either ear on the OSHA 200 log?

19. Are signs posted indicating areas or operations requiring hearing protection?

20. Is the hearing protection program inspected annually?
OSHA Self-Checkup

FACILITY INFORMATION

COMPANY NAME:

LOCATION(S):

PERSON COMPLETING AUDIT:

DATE:

PHONE:

SAFETY RESPONSIBILITY ASSIGNED TO:

PRIMARY ACTIVITY OF FACILITY:

NUMBER OF EMPLOYEES:

OTHER INFORMATION:
OSHA Self-Checkup

CONTENTS

Introduction ........................................................................................................................................5
Written Safety Program ..........................................................................................................................6
Safety Committees ....................................................................................................................................7
OSHA Posting .........................................................................................................................................8
Record Keeping .......................................................................................................................................9
    Medical Records ............................................................................................................................10
    Training Records ..........................................................................................................................11
    Accident Reporting and Investigation ...............................................................................................12
Safety Inspections .................................................................................................................................13
Housekeeping .........................................................................................................................................14
Material Handling .................................................................................................................................15
Emergency Evacuation Planning ............................................................................................................16
Fire Prevention, Hazardous Materials Handling .....................................................................................19
    Fire Extinguishers ...........................................................................................................................21
Electrical Protection ...............................................................................................................................22
Machine Guarding .................................................................................................................................24
Lockout and Tagout .................................................................................................................................25
Personal Protective Equipment ...............................................................................................................27
Eye and Face Protection ..........................................................................................................................29

OSHA Self-Checkup

CONTENTS CONTINUED

Respiratory Protection ................................................................. 31
Hearing Protection .......................................................................... 33
Hazard Communication ................................................................. 35
Lead Protection .............................................................................. 37
Asbestos Protection ........................................................................ 38
Confined Spaces ........................................................................... 39
Hazardous Waste Operations and Emergency Spill Response .......... 41
Bloodborne Pathogens ................................................................. 43
Hazardous Chemicals ................................................................. 45
Other Potential Issues ................................................................. 47
INTRODUCTION

The OSHA Self-Checkup is a series of questions about your facility’s safety and health practices. The Self-Checkup covers areas of concern, such as hazard communication, and lists questions that are relevant to compliance. Topics begin by noting the applicable OSHA regulations. The investigating person answers questions with Yes, No, or Follow up. You can use the follow-up section as a place to identify your response or questions to the findings. Questions without answers are not applicable or were not evaluated. At the end of each topic is a checklist of suggested actions.

This OSHA Self-Checkup provides you with directions on how to continue to develop your facility’s workplace safety and health program. While it identifies some specific potential compliance issues, it cannot ensure complete compliance with all OSHA regulations, as the conditions and work practices described by the person completing the form may not be representative of all circumstances in your facility. This self-audit is not a professional review of your facility’s compliance with OSHA health and safety regulations. Rather, it is a tool to help you identify your compliance needs. Additional help from a qualified professional may be necessary for certain issues. Continued attention to safety and health is the best assurance of compliance.
OSHA Self-Checkup

WRITTEN SAFETY PROGRAM

A written safety program, while not required by OSHA, is important for establishing and managing a safety program. It should define company policy concerning OSHA regulations.

1. Does your company have a written safety program?
   Yes  No  Follow up

2. Has a person or persons been designated the responsibility of administering the safety program?
   Yes  No  Follow up

3. Does the safety program include enforcement policies to ensure safety rules are followed?
   Yes  No  Follow up

Other Information:

Suggested Actions:

- Prepare written safety program and assign responsibility.
- Review existing program annually to keep it up to date.
- Other:
OSHA Self-Checkup

SAFETY COMMITTEES

Requiring safety committees is being proposed by OSHA. A safety committee is a good method of involving employees in health and safety.

1. Does your company have a safety committee?
   
   Yes  No  Follow up

2. Does the safety committee meet regularly, following a written agenda, with provisions for documenting meetings and follow-up actions?

   Yes  No  Follow up

3. Is one person responsible for coordinating the safety committee:

   Yes  No  Follow up

4. Do you allow employees the opportunity to be involved with the safety committee?

   Yes  No  Follow up

5. Does your safety committee regularly perform safety inspections?

   Yes  No  Follow up

Suggested Actions:

- Develop safety committee, with assigned responsibilities and regularly scheduled meetings.

- Review existing safety committee operations on annual basis to ensure effectiveness.

- Other:
OSHA Self-Checkup

OSHA POSTING

OSHA REGULATION 29 CFR 1903.2

1. Is the poster “Safety and Health Protection on the Job” posted in a prominent area at the worksite?
   - Yes  No  Follow up

2. Are the notices furnished by OSHA posted for employees to read?
   - Yes  No  Follow up

Other Information:

Suggested Actions:

- Post the “Safety and Health on the Job” poster in a prominent area.
- Post all OSHA notices for employees to read.
- Other:
OSHA Self-Checkup

RECORD KEEPING

OSHA REGULATION 29 CFR 1904: OSHA 200 AND 101 FORMS

1. Are the OSHA 200 (Injury and Illness Log) and 101 (Report for Individual Accidents) forms kept in a location accessible at the work site?
   Yes  No  Follow up

2. Are the OSHA 200 and 101 forms kept up-to-date?
   Yes  No  Follow up

3. Is the OSHA form 200 injury and illness summary completed and posted in the employee work area by February 1 of each year?
   Yes  No  Follow up

4. Does this summary remain posted for one month?
   Yes  No  Follow up

Other Information:

Suggested Actions:

- Keep the OSHA 200 and 101 forms accessible to the site and up-to-date.
- Make sure the OSHA form 200 injury and illness summary is completed and posted in the employee work area by February 1 of each year. Keep this summary posted for one month.

Other:
**OSHA Self-Checkup**

**MEDICAL RECORDS**

1. Is someone assigned responsibility for maintaining work related medical records?
   - Yes  No  Follow up

2. Are all the medical records kept in one place?
   - Yes  No  Follow up

3. Do employees have access to their own medical records?
   - Yes  No  Follow up:

**Questions:**

**Suggested Actions:**

- Assign a person to be responsible for maintaining work related medical records. The records should be kept in one area.

- Allow employees to have access to their own medical records.

- Other:
OSHA Self-Checkup

TRAINING RECORDS

1. Are records kept of all employee safety training?
   Yes  No  Follow up

2. Do the training records include detailed information on subject, course description, the name of the trainer, the name and signature of each employee as well as a list of any training materials used?
   Yes  No  Follow up

3. Are these records kept in one convenient location?
   Yes  No  Follow up

Other Information:

Suggested Actions:
- Keep records of all training which is provided. The record should indicate the training subject, course description, the name of the trainer, the name and signature of each employee as well as a list of any training materials used (videos, booklets).
- Appoint one person responsible for maintaining the training records and keeping them in one location.
- Other:
OSHA Self-Checkup

ACCIDENT REPORTING AND INVESTIGATING

1. Does your facility have a standardized accident report form which includes the circumstances of the accident, and the extent of any injuries?
   Yes   No   Follow up

2. Is an accident report filled out for each accident?
   Yes   No   Follow up

3. Is an accident investigation performed for each accident?
   Yes   No   Follow up

4. Does the department where an accident occurred review the accident report?
   Yes   No   Follow up

5. Is a copy of the accident report given to the safety committee?
   Yes   No   Follow up

6. Are all major accidents (those involving a fatality or the hospitalization of more than three employees) reported to OSHA within eight hours?
   Yes   No   Follow up

7. Are all non-major accidents also recorded on the OSHA 200 and 101 forms?
   Yes   No   Follow up

Suggested Actions:

- Perform an accident investigation for every accident.
- Fill out an accident report for each accident.
- Give a copy of the accident report to the department where the accident occurred and a copy to the safety committee.
- Other:
OSHA Self-Checkup

SAFETY INSPECTIONS

OSHA REGULATION 29 CFR

1. Does your company perform safety inspections periodically?
   - Yes
   - No
   - Follow up

2. Does your company perform job safety analyses? A job safety analysis is an assessment of all health and safety concerns for a specific job.
   - Yes
   - No
   - Follow up

3. Do you use the job safety analyses to assist in employee training?
   - Yes
   - No
   - Follow up

Other Information:

Suggested Actions:

- Perform safety inspections on a regular basis.
- Perform a job safety analysis for high hazard jobs. Use this analysis to assist in employee training.

Other:
OSHA Self-Checkup

HOUSEKEEPING

OSHA REGULATION 29 CFR 1910.176

1. Does your company have a housekeeping schedule?
   Yes  No  Follow up

2. Are employees responsible for keeping their work area clean?
   Yes  No  Follow up

3. Are work areas, floors and aisles kept clean and free of objects?
   Yes  No  Follow up

Other Information:

Suggested Actions:

- Develop a housekeeping schedule and enforce it throughout the workplace.
- Keep all work areas, floors and aisles clean.
- Other:
**OSHA Self-Checkup**

**MATERIAL HANDLING**

**OSHA REGULATION 29 1910.176**

1. Are materials stored to ensure they do not fall or block walkways, aisles and exits?
   - Yes  No  Follow up

2. Are bags, containers, drums and bundles stored in tiers stacked, blocked, wrapped and limited in height to prevent sliding and collapse?
   - Yes  No  Follow up

3. Are mechanical means used when materials are too heavy to be lifted manually?
   - Yes  No  Follow up

Other Information:

Suggested Actions:

- Store materials so they do not create a hazard. Stack, block, and wrap bags, containers, and drums stored in tiers and limit heights to prevent falling.

- Use mechanical means to lift materials which are too heavy to move by manual means.

- Store materials in a way to provide easy accessibility to employees.

Other:
OSHA Self-Checkup

EMERGENCY EVACUATION PLANNING

OSHA REGULATION 29 CFR 1910.38

1. Does your company have a written emergency evacuation plan which meets the OSHA requirements?
   Yes  No  Follow up

2. Are the escape routes designated in a posted diagram in each work area?
   Yes  No  Follow up

3. Are there at least two means of escape which are located in different areas?
   Yes  No  Follow up

4. Are exit doors unlocked at all times and free of obstructions?
   Yes  No  Follow up

5. Are exit routes clear and free of obstruction?
   Yes  No  Follow up

6. Are exits clearly and properly marked?
   Yes  No  Follow up

7. Does your facility have special procedures for evacuating any physically impaired employees?
   Yes  No  Follow up

8. Does your facility have a procedure for accounting for all employees after an emergency evacuation?
   Yes  No  Follow up
OSHA Self-Checkup

EMERGENCY EVACUATION PLANNING CONTINUED

9. Is there a person responsible for first aid? (There does not have to be if local emergency health care facilities are sufficient.)
   Yes  No  Follow up

10. Will your company use “911” or other emergency medical services?
    Yes  No  Follow up

11. Are emergency numbers posted?
    Yes  No  Follow up

12. Does the facility have an alarm system for announcing emergencies?
    Yes  No  Follow up

13. Are all employees trained in emergency evacuation on an annual basis?
    Yes  No  Follow up

14. Has this training been documented?
    Yes  No  Follow up

Other Information:
OSHA Self-Checkup

EMERGENCY EVACUATION PLANNING CONTINUED

Suggested Actions:

- Develop a written emergency evacuation plan which includes a diagram indicating the escape routes.
- Ensure there are at least two means of escape in different locations and that all exit routes are clear and free of obstruction.
- Make sure the fire doors are not blocked or locked and the exits are clearly and properly marked.
- Develop a plan for evacuating any physically impaired employees and for accounting for all employees after an evacuation.
- Assign an individual to be responsible for first aid, or decide if your facility will use 911 or other emergency medical services. Post emergency contact numbers.
- Install an alarm system and make sure all employees are familiar with the sound of the alarm.
- Train employees on emergency evacuation on an annual basis, and document this training.

Other:
OSHA Self-Checkup

FIRE PREVENTION, HAZARDOUS MATERIALS HANDLING


1. Have potential workplace fire hazards been identified in a written plan (fire hazards include flammable chemicals, machinery operated at high temperatures, etc.)?

   Yes  No  Follow up

2. Are there persons responsible for inspecting and preventing fire hazards?

   Yes  No  Follow up

3. Do housekeeping methods prevent the accumulation of flammable materials? i.e.: (Are old chemicals disposed of and is equipment properly maintained?)

   Yes  No  Follow up

4. Do employees receive training annually on proper handling and use of equipment or materials which may be potential fire hazards?

   Yes  No  Follow up

5. Are flammable liquids properly stored? (These materials should be stored according to the directions provided by the supplier.)

   Yes  No  Follow up

Suggested Actions:

- Identify workplace fire hazards.
- Develop a housekeeping schedule to prevent accumulation of hazardous materials. Appoint persons responsible for inspecting and preventing the fire hazards.
Perform annual training for employees for proper handling of equipment and/or materials which may be fire hazards.

Assure that flammable liquids are stored correctly.

Other:
OSHA Self-Checkup

FIRE EXTINGUISHERS

1. Does the facility have the required number of portable fire extinguishers? (The required number depends on the size of the facility and the materials and chemicals present.)
   - Yes
   - No
   - Follow up

2. Have fire extinguishers had an annual inspection by a qualified person, such as a fire inspector?
   - Yes
   - No
   - Follow up

3. Are all fire extinguishers re-serviced once they have been used:
   - Yes
   - No
   - Follow up

4. Have all employees received annual training on proper fire extinguisher use?
   - Yes
   - No
   - Follow up

Suggested Actions:

- Provide an appropriate number of the proper type of fire extinguishers for the workplace.
- Have all fire extinguishers inspected annually by a qualified person.
- Provide training to employees annually on proper fire extinguisher use.
- Other:
OSHA Self-Checkup

ELECTRICAL PROTECTION

OSHA REGULATION 29 CFR 1910.301-.399

1. Are electrical installations designed and installed using equipment and methods approved according to the National Electric Code standards?
   Yes   No   Follow up

2. If electrical equipment is used in hazardous locations (such as flammable material handling and storage), is it approved for such use?
   Yes   No   Follow up

3. Are only trained and qualified employees allowed to do electrical work on or near exposed or energized parts?
   Yes   No   Follow up

4. Are power tools and other electrical devices held in the hands double insulated or properly grounded?
   Yes   No   Follow up

5. Are electrical extension cords used?
   Yes   No   Follow up

6. Are electrical outlets overloaded?
   Yes   No   Follow up

Other Information:
OSHA Self-Checkup

ELECTRICAL PROTECTION CONTINUED

Suggested Actions:

- Install electrical equipment which meets the National Electric Code standards.
- Install electrical equipment which is approved for hazardous locations where necessary.
- Allow only trained and qualified employees to perform electrical work on or near exposed or energized parts.
- Properly ground all electrical devices and do not overload electrical outlets.
- Use double insulated or properly grounded power tools.
- Use electrical extension cords properly, do not overextend, stretch or pull the cord or use as a permanent source of power.

Other:
OSHA Self-Checkup

MACHINE GUARDING

OSHA REGULATION 29 CFR 1910.211-212

1. Are there machine guards on equipment which has parts which may potentially cause injury to the operator or other employees?
   Yes  No  Follow up

2. Are the guards affixed to the machine or secured to the machine if attachment is impossible?
   Yes  No  Follow up

3. Are the machine guards at the point of operation?
   Yes  No  Follow up

Other Information:

Suggested Actions:

|| Install machine guards on any equipment which may cause injury to the operator or other employees in the area.

|| Affix machine guards at the point of operation.

|| Do not allow a machine to operate unless the guard is in place.

|| Other:
OSHA Self-Checkup

LOCKOUT AND TAGOUT

OSHA REGULATION 29 CFR 1910.147

This standard covers the control of hazards during servicing and maintenance of machines and equipment in which the unexpected start-up or release of stored energy could cause injury to employees.

1. Is there a written lockout/tagout program which meets the OSHA requirements?
   Yes  No  Follow up

2. Is a person responsible for administering the lockout/tagout program?
   Yes  No  Follow up

3. Is equipment that requires lockout/tagout identified?
   Yes  No  Follow up

4. Is there a specific lockout/tagout procedure for each piece of equipment as required by the standard?
   Yes  No  Follow up

5. Is there an annual inspection of the lockout/tagout program?
   Yes  No  Follow up

6. Have all employees been trained annually on proper lockout/tagout procedures?
   Yes  No  Follow up

7. Has this training been documented?
   Yes  No  Follow up
OSHA Self-Checkup

LOCKOUT/TAGOUT CONTINUED

Other Information:

Suggested Actions:

- Identify all equipment that requires lockout/tagout.
- Develop a written lockout/tagout program and assign one person responsible for administering the program.
- Develop specific lockout/tagout procedure for each piece of equipment covered by the standard.
- Perform annual inspections of the lockout tagout program.
- Provide annual training to employees and document the training.
- Other:
OSHA Self-Checkup

PERSONAL PROTECTIVE EQUIPMENT

OSHA REGULATION 29 CFR 1910.132

1. Do employees use personal protective equipment?
   Yes  No  Follow up

2. Is there a written hazard assessment to determine which tasks require personal protective equipment?
   Yes  No  Follow up

3. Are employees provided with protective equipment based on the hazards identified in the assessment?
   Yes  No  Follow up

4. Is the protective equipment adequate in design and construction as required by OSHA?
   Yes  No  Follow up

5. Is personal protective equipment maintained?
   Yes  No  Follow up

6. Are employees trained to properly use, wear, clean, and maintain all personal protective equipment?
   Yes  No  Follow up

7. Is the employee training documented in writing?
   Yes  No  Follow up

Other Information:
OSHA Self-Checkup

PERSONAL PROTECTIVE EQUIPMENT CONTINUED

Suggested Actions:

- Perform a hazard assessment in writing to determine which tasks require personal protective equipment.

- Provide employees with the appropriate personal protective equipment which is adequate in design and construction.

- Keep the personal protective equipment in sanitary and reliable condition.

- Train employees to properly use, wear, clean, and maintain personal protective equipment.

- Other:
OSHA Self-Checkup

EYE AND FACE PROTECTION

OSHA REGULATION 29 CFR 1910.133

1. Are eye and face shields worn by employees?
   Yes  No  Follow up

2. Are eye and face protectors an approved type accepted by OSHA?
   Yes  No  Follow up

3. Are eye and face protectors maintained?
   Yes  No  Follow up

4. Are eye wash stations in the workplace?
   Yes  No  Follow up

5. Are people wearing glasses or spectacles fitted with prescription safety glasses, or other approved form of eye protection worn over the spectacles?
   Yes  No  Follow up

Other Information:
OSHA Self-Checkup

EYE AND FACE PROTECTION CONTINUED

OSHA REGULATION 29 CFR 1910.133

Suggested Actions:

- Provide approved eye and face protection for employees that work in areas which may have potential dangers such as flying objects or splashing chemicals.
- Provide eye wash stations in the workplace.
- Keep all eye and face protection clean and in good repair.
- Fit people who wear prescription glasses with safety glasses.
OSHA Self-Checkup

RESPIRATORY PROTECTION

OSHA REGULATION 29 CFR 1910.134

1. Do employees at the facility wear respirators?
   Yes  No  Follow up

2. Does your facility have a written respiratory protection program?
   Yes  No  Follow up

3. Is someone assigned responsibility for administering the respiratory protection program?
   Yes  No  Follow up

4. Are there written procedures covering the various aspects of the respirator program, including:
   - Designation of an administrator
   - Work area surveillance
   - Respirator selection
   - Use of approved equipment
   - Medical evaluation
   - Issuance of equipment
   - Proper fit tests
   - Employee training
   - Proper maintenance, storage and repair
   - Inspection prior to every use

   Yes  No  Follow up

5. Are employees provided annual physicals, including a pulmonary function test, before being assigned to wear a respirator?
   Yes  No  Follow up
RESPIRATORY PROTECTION CONTINUED

6. Has air monitoring been performed to determine if respirators are required?
   Yes  
   No   
   Follow up

7. Have all affected employees been trained annually in proper respirator use?
   Yes  
   No   
   Follow up

8. Have fit tests been conducted at least annually (more frequent testing required for some exposures such as asbestos)?
   Yes  
   No   
   Follow up

Other Information:

Suggested Actions:

- Develop a written respirator plan which must include at least the items listed above.
- Provide physical exams to employees and receive medical approval before allowing them to wear respirators.
- Assign a person(s) responsible for administering the respiratory protection plan.
- Have air monitoring conducted to determine if respirators are required.
- Perform respirator fit testing.
- Other:
OSHA Self-Checkup

HEARING PROTECTION

OSHA REGULATION 29 CFR 1910.95

1. Are any employees potentially exposed to excessive noise (85 dB or above)?
   Yes  No  Follow up

2. Has noise monitoring been performed to determine noise exposures each year?
   Yes  No  Follow up

3. Are employees provided with hearing protection?
   Yes  No  Follow up

4. Do employees wear hearing protection?
   Yes  No  Follow up

5. Does your company have a hearing conservation program which meets the OSHA requirements?
   Yes  No  Follow up

6. Do employees receive audiograms annually?
   Yes  No  Follow up

7. Are employees trained on proper hearing protection use annually?
   Yes  No  Follow up

8. Are records of the audiograms and training kept?
   Yes  No  Follow up
OSHA Self-Checkup

HEARING PROTECTION CONTINUED

Other Information:

Suggested Actions:

- Perform noise monitoring to determine noise exposures. If exposures exceed OSHA limits then employees are required to wear hearing protection.
- Develop a written hearing conservation program.
- Provide employees with annual audiograms.
- Provide employees with a variety of adequate hearing protection devices. Provide annual training to employees on proper hearing protection use. Keep records of training and employee audiograms.
- Provide annual training to employees on proper hearing protection use. Keep records of training and employee audiograms.
- Other:
OSHA Self-Checkup

HAZARD COMMUNICATION

OSHA REGULATION 29 CFR 1910.1200

1. Do you have an inventory of the hazardous materials used by your facility?
   Yes  No  Follow up

2. Does your company have a written hazard communication program which meets the OSHA requirements?
   Yes  No  Follow up

3. Do employees receive hazard communication training annually?
   Yes  No  Follow up

4. Are the Material Safety Data Sheets (MSDS’s) kept in areas where employees have access to them?
   Yes  No  Follow up

5. Do hazardous materials have the proper labels (labels should identify the hazardous chemical (s), have the appropriate hazard warning and the name and address of the chemical manufacturer)?
   Yes  No  Follow up

6. Do secondary containers have the proper labeling? (Secondary labels should identify the hazardous chemical (s), have the appropriate hazard warning and the name and address of the chemical manufacturer.)
   Yes  No  Follow up

Other Information:
HAZARD COMMUNICATION CONTINUED

OSHA REGULATION 29 CFR 1910.1200

Suggested Actions:

- Inventory hazardous materials and develop a written hazard communication program.
- Keep MSDS sheets in an area accessible to employees.
- Provide training for employees on hazard communication.
- Properly label hazardous materials and secondary containers.
- Other:
LEAD PROTECTION

OSHA REGULATION 29 CFR 1910.1025

1. Are employees potentially exposed to lead during their normal work activities?
   Yes  No  Follow up

2. Do you have a written compliance program for lead which meets OSHA Standards?
   Yes  No  Follow up

3. Do you provide medical monitoring for employees potentially exposed to lead?
   Yes  No  Follow up

Other Information:

Suggested Actions:

- Determine if employees are exposed to lead.
- Develop a written compliance program for lead exposure.
- Provide medical monitoring for employees potentially exposed to lead.
- Other:
OSHA Self-Checkup

ASBESTOS PROTECTION

OSHA REGULATION 29 CFR 1910.1001 AND 1926.58

1. Are employees potentially exposed to asbestos during normal work activities?
   Yes  No  Follow up

2. Do you have a written compliance program for asbestos which meets OSHA requirements?
   Yes  No  Follow up

3. Do you provide medical monitoring for employees potentially exposed to asbestos?
   Yes  No  Follow up

Other Information:

Suggested Actions:

- Determine if employees are exposed to asbestos.
- Develop a written compliance program for asbestos exposure.
- Provide medical monitoring for employees potentially exposed to asbestos.
- Other:
OSHA Self-Checkup

CONFINED SPACES

OSHA REGULATION 29 CFR 1910.146

A confined space:

- Is large enough to be entered by an employee
- Has only one or a limited means of entry
- Is not designed for regular occupancy

Examples include manholes, pits, tunnels, processing equipment and vessels.

1. Are there confined spaces at your facility?
   - Yes  No  Follow up

2. Do employees have to enter confined spaces?
   - Yes  No  Follow up

3. Do you have a written confined spaces entry program which meets OSHA requirements?
   - Yes  No  Follow up

4. Do employees receive training prior to entering confined spaces and on an annual basis?
   - Yes  No  Follow up

5. Is the air tested prior to entering confined spaces?
   - Yes  No  Follow up

6. Is forced ventilation used in the confined spaces?
   - Yes  No  Follow up

Other Information:
CONFINED SPACES CONTINUED

Suggested Actions:

- Determine if employees enter confined spaces.
- Develop a written compliance program for confined space entry.
- Provide training for employees entering confined spaces.
- Test and ventilate prior to entering confined spaces as part of complete program.
- Other:
OSHA Self-Checkup

HAZARDOUS WASTE OPERATIONS/EMERGENCY SPILL RESPONSE

OSHA REGULATION 29 CFR 1910.120

1. Do you know whether you have bulk quantities (over thirty gallons) of hazardous materials at your facility?
   - Yes
   - No
   - Follow up

2. If a hazardous material spills do you call in an outside responder qualified to contain and dispose of hazardous materials?
   - Yes
   - No
   - Follow up

3. If you handle large spills of hazardous materials internally, do you have an emergency response team trained according to the requirements of 1910.120 paragraph q?
   - Yes
   - No
   - Follow up

4. Are emergency spill response team members provided with annual refresher training?
   - Yes
   - No
   - Follow up

5. Do you have a written emergency spill response program at your facility which meets OSHA requirements?
   - Yes
   - No
   - Follow up

Other Information:
OSHA Self-Checkup

HAZARDOUS WASTE OPERATIONS/EMERGENCY SPILL RESPONSE CONTINUED

OSHA REGULATION 29 CFR 1910.120

Suggested Actions:

- Determine if bulk quantities of hazardous materials are at the facility.
- Find an outside contractor or qualified group to provide emergency spill response.
- Choose employees to be emergency response team members and send them for training.
- Give the emergency response team refresher training.
- Prepare a site-specific emergency spill response plan.
- Other:
OSHA Self-Checkup

BLOODBORNE PATHOGENS

OSHA REGULATION 29 CFR 1910.1030

Bloodborne pathogens are living organisms capable of causing diseases in humans. Bloodborne pathogens can live in human blood, tissues or bodily fluids.

1. Are employees potentially exposed to bloodborne pathogens via blood, human tissues, or bodily fluids?
   Yes  No  Follow up

2. Does the facility have a written exposure control plan which meets the OSHA requirements?
   Yes  No  Follow up

3. Do employees receive training in bloodborne pathogen exposure control?
   Yes  No  Follow up

4. Are employees who are exposed to bloodborne pathogens offered the Hepatitis B vaccine at no charge?
   Yes  No  Follow up

5. Is a post-exposure medical evaluation and follow-up provided to employees after an exposure incident?
   Yes  No  Follow up

Other Information:
**OSHA Self-Checkup**

**BLOODBORNE PATHOGENS CONTINUED**

Suggested Actions:

1. Determine if employees are exposed to bloodborne pathogens.
2. Develop a written exposure control plan.
3. Provide training for employees who are exposed to bloodborne pathogens.
4. Provide employees the Hepatitis B vaccine at no charge.
5. Provide post-exposure medical evaluation and follow-up to employees who have had an incident exposure.

Other:
HAZARDOUS CHEMICALS

There are several chemicals which are specifically regulated by OSHA. These substances and the OSHA regulation for each are listed below. Check each chemical that is used in the facility. Please list any other chemicals used at your facility.

- 4-Nitrobiphenyl (29 CFR 1910.1003)
- alpha-Naphthylamine (29 CFR 1910.1004)
- Methyl chloromethyl ether (29 CFR 1910.1006)
- 3,3'-Dichlorobenzidine (and its salts) (29 CFR 1910.1007)
- bis-Chloromethyl ether (29 CFR 1910.1008)
- beta-Naphthylamine (29 CFR 1910.1009)
- 4-Aminodiphenyl (29 CFR 1910.1011)
- Ethyleneimine (29 CFR 1910.1012)
- beta-Propiolactone (29 CFR 1910.1013)
- 2-Acetylaminofluorene (29 CFR 1910.1014)
- 4-Dimethylaminoazobenzene (29 CFR 1910.1015)
- N-Nitrosodimethylamine (29 CFR 1910.1016)
- Vinyl chloride (29 CFR 1910.1017)
- Inorganic arsenic (29 CFR 1910.1018)
- Cadmium (29 CFR 1910.1027)
- Benzene (29 CFR 1910.1028)
OSHA Self-Checkup

HAZARDOUS CHEMICALS CONTINUED

- Cotton dust (29 CFR 1910.1043)
- 1,2-dibromo-3-chloropropane (29 CFR 1910.1044)
- Acrylonitrile (29 CFR 1910.1045)
- Ethylene Oxide (29 CFR 1910.1047)
- Formaldehyde (29 CFR 1910.1048)
- Methylenedianiline (29 CFR 1910.1050)

Suggested Actions:

- Review the requirements of the identified OSHA regulation.
- Other:
OSHA Self-Checkup

OTHER POTENTIAL ISSUES

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OSHA Self-Checkup

FURTHER ASSISTANCE

Theodore J. Hogan & Associates, Inc. can assist you in developing your OSHA compliance programs. Please contact us at 708-325-3939, (FAX 708-325-3962) to discuss your needs.