Environment, Health & Safety

Levi Strauss & Co. has prepared this Environment, Health and Safety (EHS) chapter to help our business partners meet our Social and Environmental Sustainability requirements. EHS requirements are no less important than meeting our quality standards or delivery time.

Importance of Meeting Requirements

One of our requirements for Health and Safety focuses on emergency preparedness. Several years ago, one of our factories in central Mexico installed additional emergency exits and conducted evacuation drills to comply with this requirement. Four months later, a massive earthquake occurred.

The factory's recent efforts to fulfill requirements ensured that its 800 employees were able to evacuate quickly and safely. As you can see, careful attention to meeting our requirements is critical to providing a safe and health working environment for your employees.

Using this Chapter

We have prepared this chapter to help you meet Levi Strauss & Co.'s EHS requirements, but we do not herein identify all circumstances which might constitute "findings" in a TOE Assessment. Rather, we address topics which are of particular importance. Each business partner must make a careful assessment of each of its workplaces to determine what measures to put in place to meet our requirements, and, of course, the requirements of the countries where it operates. To help our partners with this site-specific analysis, we not only include specific information in this Handbook, but we also identify where additional information may be found regarding each requirement.

Each of the EHS topics in this chapter is organized into four sections: Application, Purpose, Requirements, and Implementation of Requirements. **Please note that LS&Co. will hold its business partners accountable for those items identified as "Requirements" only.** The sections labeled "Implementation of Requirements" provide examples of ways to comply with the requirements. These sections close with a "Plan-Do-Check-Act" cycle, illustrating a sample strategy for implementing a specific EHS program — for example, emergency preparedness, electrical safety, etc. This strategy will help business partners integrate their EHS programs into an EHS management system.

Finally, we encourage our business partners to pay close attention to the documentation and record keeping requirements. LS&Co. assessors rely on written records to verify that business partners meet requirements such as: having established EHS procedures, conducting regular inspections, and training workers.

Application

This information applies to all factories covered by Sustainability for LS&Co., unless otherwise noted.

Safety Guidelines

Levi Strauss & Co.

Safety Committees

Purpose

Safety committees can identify and correct factory health and safety issues, increase safety awareness, and improve workers' job satisfaction. The purpose of this section is to describe the requirements for having a well-run and effective safety committee.

Requirements

CI Factories should have active safety committees.

CI Safety committees should meet at least once per month, and more often if needed.

CI Safety committees should include management representatives, workers from various factory operations, and union representatives (if the factory has a union).

CI A written record of the safety committee meetings should be agreed upon by the committee leaders, posted in a workplace location for factory workers to read, and kept on file for a minimum of five (5) years.

CI Head of Safety Committee should have the right to perform consultations with external experts if it is needed.

Implementation of Requirements

Training, Rules and Record Keeping

- Safety committee members should be trained to:
  - Investigate accidents and other health and safety events at the factory.
  - Conduct inspections and recognize hazards (see Risk Assessment section).
  - Identify and evaluate health and safety trends.
  - Use health and safety resources within the factory or community.
- A management representative and a factory worker should be chosen as leaders. The leaders should plan the agenda prior to the meeting.
- The safety committee should agree on rules to run the meetings effectively.

Hazard Assessment

- A safety committee member should be involved in all accident and event investigations.
- Safety committees should review accident or event reports to make sure actions are taken to correct hazards and to avoid a similar event in the future. (Note: the privacy of the person(s) involved in the accident or event should be respected.)
- Safety committees should thoroughly inspect the factory once per month and record the results. (See Risk Assessment, Aisles and Exits, and Housekeeping sections.)

- Safety committees should be able to use factory health and safety data to analyze accident and event trends. This will help safety committees focus on activities to better control hazards.

Hazard Controls

- Once they have identified hazards in a factory inspection, safety committees should prioritize actions to correct these hazards as soon as possible. Safety committees should follow up on the corrective actions until they have been completed.
- Health and safety resources should be made available to safety committees, including:
  - Website link for EU: http://osha.europa.eu/en/about
  - Website link for U.S. OSHA: http://www.osha.gov/
  - The LS&Co. Social & Environmental Sustainability Handbook

For further information: see Appendix A

Risk Assessment

Purpose

The purpose of this section is to identify all hazards within the workplace which could reasonably be expected to cause harm and to assess the risks presented by those hazards. Hazards include, but are not limited to, those which are the subject of the other sections of the Guidebook.

Requirements

IA Factories must have a procedure for identifying workplace hazards and assessing their risks.

CI Factories should review their risk assessments and safety action plans on a periodic basis.

Implementation of Requirements

Training, Rules and Record Keeping

- Individuals or teams should be trained to identify hazards, assess their risks, and evaluate the effectiveness of control measures.
- Risk assessments should be recorded in writing and made available to factory workers.

Hazard Assessment

- Individuals responsible for risk assessment should tour the entire factory, looking for operations or work practices that could harm workers or the environment. The EHS Handbook sections should be used as a guide for the types of hazards to look for, but those touring the factory should look for hazards that may not be covered by the Handbook.
- Before the tour, review Safety Data Sheets and worker accident and injury records. During the tour, ask workers to help identify workplace hazards. Focus on hazards that could result in significant harm, such as flammable materials, unguarded moving machinery parts, lack of fall protection railings (where needed), pressurized systems, chemicals without labels, chemical containers that lack secondary containment, damaged electrical wiring, fumes, extreme temperatures or noise, and high-speed ejection of material.
- Determine who may be harmed by these hazards and how.
- Assess the risk by evaluating (a) the severity of the harm that may be caused and (b) the likelihood that an event that results in that harm will occur. For example, consider workers on an elevated platform without fall protection railings. What's the worst harm that might result? (Broken bones, even death.) How likely is it that an event resulting in broken bones or death might occur? (This is a serious risk and action should be taken immediately to install fall protection railings!)

Hazard Controls

- The risk assessors should evaluate the existing precautions for the hazards identified in the tour. Are they adequate? Can the risk be eliminated or reduced by taking additional action?
- Prepare a report, summarizing the hazards identified, the assessment of risks, and any recommendations for new risk control measures. Factories must make sure this report is available for workers to read.
- Make sure to do the hazard tour and risk assessment each year or whenever there have been significant changes to factory operations.

Emergency Preparedness

Purpose

Emergency events include fires, earthquakes and accidents. Injuries to workers and damage to buildings and equipment can be reduced if emergencies are planned for in advance. This section describes the requirements for planning and preparing to protect workers in the event of an emergency.

Requirements

IA A senior factory manager must be assigned responsibility for making sure that the factory has procedures in place to prepare for, and respond to, emergency situations.

IA Factories must have procedures to prepare for possible emergencies such as fire, earthquakes, hurricanes, and chemical spills. These procedures must be written in a language that all workers understand.

IA Factories must have an emergency evacuation plan, and evacuation routes must be posted in each work area.

CI Factories should have assigned locations that can shelter the entire worker population in case of a severe weather event.

CI Factories should hold emergency evacuation drills often enough that workers know the drill procedure and consider it routine.

- At least one drill should be done annually.
- Hazardous materials emergency accident handling should be included into the fire drill.

CI Factories should have a fire prevention plan.

CI Factories should be provided to workers. Evidence of it should be available and workers should prove knowledge of the training program through workers interviews.

Implementation of Requirements – Emergencies that require evacuation

Training, Rules and Record Keeping

- Workers on all shifts should be trained to use fire extinguishers.
- This training should include hands-on practice with fire extinguishers, as well as reading materials and demonstrations. Factories should keep written records to show this training has been given.

- Factories should assign individuals with responsibility for planning and holding emergency evacuation drills. These individuals should be qualified to lead the drills. Drills should be held at various times and under various conditions to model an actual emergency.
- Workers should be trained on emergency evacuation procedures. Visitors should also be informed about evacuation plans.
- Factories should keep records of emergency evacuation drills.
- These records should include details about the drill (e.g., the time the last person exited the building, an accounting of all workers, any issues noticed during evacuation, plans to correct such issues). Records should also be kept on the maintenance and testing of emergency equipment (such as fire extinguishers, lighting, alarms, etc.).
- Factories should post "Danger," "Warning," and "No Smoking" signs where needed, and in a language that all workers understand.

Hazard Assessment

- Factories should consider all the types of emergencies that may occur at their location (e.g., fire, chemical spill, earthquake, typhoon, etc.) and include them in emergency preparedness procedures. (See Appendix).

Hazard Controls

- Factories should have rules and procedures to make sure that aisles and exits are kept clear, are properly and clearly marked, and allow workers to quickly and safely leave the factory in an emergency. (See Aisles and Exits section.)
- Factories should have emergency evacuation procedures that require all workers and managers to participate in drills. During a drill, workers and managers should leave the building, go to an assigned location (assembly area) and remain there until a signal is given to return to the factory. The focus should be on orderly evacuation, rather than on speed. Factories should hold at least one emergency evacuation drill every year during which all workers are evacuated within 3 minutes.
- Emergency lights should be tested regularly and kept in proper working order. (See Lighting section.)
- Fire extinguishers should match the potential fire hazard and should be located within 15 m (50 ft) of flammable liquids and 23 m (75 ft) of every worker. (See Appendix.)
- Fire extinguishers should have maintenance tags attached to them to indicate the date they were last checked and serviced. In addition, there should be a diagram that shows workers how to use fire extinguishers in the immediate area.

Good practice: Fire extinguisher types for potential hazards are provided and tagged

- A reasonable number of battery-operated emergency lights should be placed in useful locations in order to light aisles, halls, and stairways along evacuation routes, with the batteries tested with sufficient frequency to ensure that they are functioning properly. (See Lighting section.)
- Factories should have a separate fire alarm that:
  - has a sound that only means "fire" (and not any other type of emergency);
  - may be heard throughout the factory; can be activated at various points throughout the factory; and
  - has a back-up battery or an uninterruptible power supply.
- Alarms should be tested regularly and maintained in proper working order.
- In addition to the factory's audible alarm, a visible fire alarm (such as a flashing light) should be installed in all work areas that require workers to wear hearing protection.

Good practice: Fire alarm switch in native language

Implementation of Requirements – Emergencies that require evacuation

- Factories should hold at least one shelter-in-place drill every year. Records should be kept of this drill.
- Workers should be trained on shelter-in-place procedures. (See Appendix A)
- Shelter-in-place locations should be located in the most stable areas of the building (e.g., near structural supports such as load-bearing walls).

Building Integrity

Purpose

The Property Condition Guideline section outlines the procedures for evaluating the physical condition of a building. The procedures consist of a visual inspection and an interview with the property owners and managers. In addition, the assessment includes a review of building plans, documents and statutory research. Factory management shall present high level knowledge about their site, all possible natural and manmade hazards, and building integrity.

Requirements

Documents, permits, certificates

ZTV * Factories shall have a valid building certificate of occupancy.

IA * Factories shall be able to present the legal classification of the site location regarding earthquake zone, flooding areas, soil structure and saturation, groundwater level, torrential rainfall, flooding, snow loading and landslide.

IA * Factories shall be able to make available to the assessor the design and descriptions of the building structure including blueprints, general construction details such as type of material used in framing, information on the foundation, walls and floors and type of roof.

***ZTV** *If the above 3 points are not met, then the factory shall commission and pay for a building integrity survey by an LS&Co. approved contractor.*

IA Factories shall be able to present to the assessor the extent to which the building can resist certain local climatic conditions such as wind, earthquake or hurricane force winds, and flooding.

IA Factory management shall be able to present to assessor the permit for the maximum number of people allowed to be in the building at one time. Multi-story buildings shall have the maximum occupancy number for each floor posted on the floor.

CI Factories shall have a list of all building components, including but not limited to stairwells, staircases, rails, verandas, hallways, doors, windows, walls and roofs, HVAC systems, fire and safety equipment, elevators and electrical systems.

CI The listing for each building component shall be accompanied by a detailed description of its condition and the dates of the previous and annual schedule of periodic preventive checks and maintenance.

CI The comprehensive list of building components shall be a tool to track the health and safety of the building and shall be reviewed and approved periodically by the factory owner or general manager.

CI Factories shall be able to present proof of regular inspection by a competent technician regarding plumbing, roofing, interior and exterior building structure and heating, air conditioning and ventilation systems performed by competent technician.

Structure

IA The building structures shall be verified to comply with the earthquake demand of three-quarters (3/4) of the current local requirements for new construction with similar occupancy ratings.

IA The buildings shall meet the basic Tier 1 acceptance criteria established by ASCE 41-13, or a similar country seismic standard for evaluating existing buildings.

IA Factories' structure shall not exceed the maximum expected loads described by the building's certificate of occupancy.

IA Factories shall be able to document that staircase installations are ensuring adequate access and exits for the maximum number of people expected in the building at one time.

IA Factories shall provide unobstructed road access to the building and ensure adequate access to emergency equipment and adequate access to the unobstructed road from the emergency exits for the building's maximum permitted occupancy.

CI Factories shall be in good repair, free from signs of vandalism, with walls, doors and windows free from cracks, broken panes or other damage.

CI Factories' building components shall be well maintained with a remaining life of at least 10 years. Items that need repair, such as loosened railings, cracked windows, damaged walls, exposed wires, leaking roof areas, and damaged fixtures and walls and columns, shall be reported and corrected immediately.

CI Factories shall be able to present evidence of maintenance work or repairs (for example, each visually recognizable repair undertaken).

Safety Procedures

IA A senior factory manager shall be assigned responsibility for making sure that the factory has proper procedures in place to prepare for, and respond to, emergency situations at the factory, and shall ensure that these are understood by each employee before undertaking work at the factory.

IA Factories shall have procedures to prepare for possible emergencies such as fire, earthquakes, hurricanes, and chemical spills. These procedures must be written in a language that all workers understand.

IA The emergency preparedness shall give emphasis that suppliers in high seismic risk shall specifically address earthquake preparedness.

IA Factories shall have an emergency evacuation plan, and evacuation routes must be posted in each work area.

IA Factories shall have a training program for all employees that cover the building safety elements, signs of potential problems and the immediate reporting channels.

CI Evidence of high quality worker building safety training shall be available for review and workers should demonstrate knowledge of the training program through worker interviews.

Hazard Assessment

CI Factories shall be prepared for all the types of emergencies that may occur at their location (e.g., fire, chemical spill, earthquake, typhoon, etc.) and include them in emergency preparedness procedures.

Aisles and Exits

Purpose

The purpose of this section is to make sure that factory aisles and exits are kept clear, are well marked, and allow workers to quickly and safely exit the factory in an emergency.

Requirements

IA Emergency exits must be unlocked during working hours so workers may exit during emergencies. This may be rated **ZTV** if factory is in violation of forced labor guidelines

IA Factories must have enough exits to safely serve the number of workers and the height and type of building or structure:

- Factory floors with 150 or fewer workers must have at least 2 (non-elevator) exits. Factory floors with more than 150 workers must have at least 3 (non-elevator) exits. Exits must lead to a safe location outside the building and must be within 61 meters (200 feet) of every workstation.
- Buildings with 1000 or more workers must have at least 4 exits.
- Additional exits must be provided in every section of a building where size, worker population, and work area arrangement would endanger workers trying to use a single exit that is blocked by fire or smoke.

IA Aisles and exits must be kept clear and unblocked at all times. Exits must be unlocked at all times during working hours.

IA Exit doors must open outward (in the direction of the way out of the building). They must require no special operation.

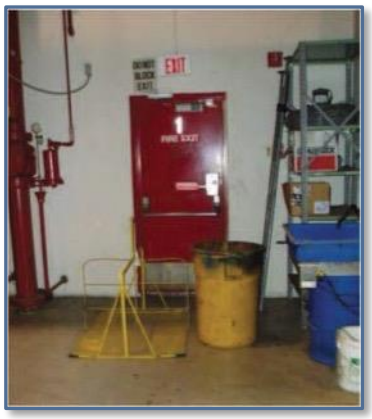
IA Exit doors, routes, and aisles must be wide enough to safely evacuate workers in an emergency:

- Exit doors must be at least 81 cm (32 in) wide.
- New exits must be at least 91 cm (36 in) wide.
- Exit routes must be at least 91 cm (36 in) wide.
- Aisles must be at least 91 cm (36 in) wide.

IA Factories must have a fire alarm system that will notify occupants throughout the entire building. This alarm must be different from other building alarms, must be used for fire and evacuation only, and must be capable of being heard throughout the entire building. It must take priority over all other alarms, and be monitored at an outside, constantly attended location such as the local fire and/or police department or alarm company. (Also see Emergency Preparedness section.)

CI Exit doors and exit routes should be marked so that they are clearly visible to factory workers throughout the factory:

- Exits should be marked with signs that are visible from 30 m (100 ft).
- All signs and markings should be in a language(s) that can be understood by all workers. Lettering should be at least 15 cm (6 in) high, brightly colored, contrasting with surrounding surfaces, illuminated to make them more visible.
- Any door, aisle, or stairway that is NOT an exit or does NOT lead to an exit and may be mistaken for an exit shall be posted with a sign that reads "NO EXIT."



Bad Practice (IA): Fire exit is blocked by trash container and equipment

CI An assembly area should be assigned outside the factory so that evacuated workers can be accounted for in an emergency.

CI Any changes to building design should be reviewed to make sure that they meet the requirements of this topic before they are implemented.

Good Practice: "Exit" sign in local language

Implementation of Requirements

Training, Rules and Record Keeping

- When they are first hired, workers should be trained on the location of exits and evacuation routes, and on the importance of keeping aisles and exits clear. (See Emergency Preparedness section.)
- All workers should be able to show they understand the above training and any related documents the factory or LS&Co. may provide on this topic.

Hazard Assessment

- Factories should inspect all areas of buildings to ensure they meet the requirements listed in the checklist in the Appendix.

Hazard Controls

- Factories should inspect building areas each month to make sure they meet the aisles and exits requirements. (See Safety Committee Requirements for further information.)

Lighting

Purpose

Poor lighting, or a complete lack of lighting (in the event of a power failure), may prevent workers from seeing possible hazards. The purpose of this section is to describe requirements for workplace and emergency lighting to help provide a safe working environment for all factory workers

Requirements

IA Factories that have night work or low natural lighting levels must provide emergency lighting in case of a power failure.

CI Lighting should meet the following required lux levels in the workplace:

Working Condition	Minimum Lighting Value (lux)
Rarely visited locations, with limited perception of detail required (e.g. storage rooms)	50
Factory floor and other continuously occupied areas (e.g., walkways) where fine detail perception is not required	200
General Office	500
Machine operator workstations, drawing board workstations, bench work, and other work stations that require fine detail perception	750

Source: Evaluation of Human Work, Second Edition, 1995, Wilson and Corlett

Implementation of Requirements

Emergency Lighting

Hazard Assessment

- Factories with night shifts should make sure that emergency lighting meets the following requirements:
- Average required lighting should be 10 lux (1 ft-candle) at floor level.
- Emergency lighting should be supplied for at least 1.5 hours if normal lighting fails, and lighting should be no less than 10 lux (1 ft-candle) at the end of that time.
- If maintaining light requires a change from one energy source (e.g., a public utility) to another (e.g., a private energy generator), any delay in providing lighting may be no more than 10 seconds.
- Factories without night shifts should evaluate natural lighting of the exit routes and determine whether it is at least 0.1 ft candle (1 lux) at floor level. If it is not, the factory should act to install emergency lighting (that meets the above requirements) in the building.

Hazard Controls

- Factories should test the emergency lighting system every 30 days for no less than 30 seconds.
- Once each year, factories with night shifts should practice emergency evacuation of the building using only emergency lighting.
- If battery-powered emergency lighting systems are used, they should be tested each year for no less than 1.5 hours. Factories should keep written records of these tests.

Required Workplace Lighting Levels

Hazard Assessment

- Factories should evaluate all areas and working conditions to make sure they meet the minimum lighting values described in the Requirements section above.

Hazard Controls

- Where areas or working conditions fail to meet the minimum lighting values, factories should act immediately to correct the situation.
- Factories should assign responsibility for maintaining proper lighting (cleaning, replacing, repairing lighting fixtures, etc.).

Housekeeping

Purpose

Good housekeeping is an important factor in preventing injuries, illnesses, and property damage that may result from hazards such as trips, slips and falls, falling objects, fires, and pest infestation.

Examples of accidents caused by poor housekeeping include:

- **tripping over loose objects on floors, stairs and platforms**
- **being hit by falling objects**
- **slipping on greasy, wet or dirty surfaces**
- **striking against poorly stacked items or misplaced material projecting into aisles**
- **cutting, puncturing, or tearing the skin of hands or other parts of the body on projecting nails,**
- **wire or steel strapping**

The purpose of this section is to promote good housekeeping to protect workers and factory property.

Requirements

IA Lint traps in dryers must be routinely cleaned and the lint removed and discarded.

CI Factories should keep stairs, aisles and exits clean. (See Aisles and Exits for further requirements.) Materials should be kept neat and orderly.

CI Scrap materials should be cleaned up daily or often enough to prevent them from collecting on floors, tabletops, in aisle ways, or other areas.

CI Litter should be stored in non-combustible containers with lids.

CI Building roofs and roof drains should be kept clean and unclogged.

CI Outside storage should be at least 7.5 meters (25 feet) away from building walls.

CI Heating, ventilation and air conditioning systems should be cleaned and maintained regularly.

Note: See also the Requirements in Solid Waste Management.

Implementation of Requirements

Training, Rules and Record Keeping

- Workers should be trained on how to properly store tools and equipment, and where and how to dispose of waste.

Hazard Assessment

- Factories should create and use a housekeeping inspection checklist to make sure housekeeping requirements are being met. (See sample checklist in Appendix.) Individuals should be assigned responsibility for doing housekeeping inspections on a regular basis.

Hazard Controls

- Factories should take action to correct conditions or situations that do not meet the housekeeping requirements. This may include improving cleaning procedures, doing building and equipment maintenance work, and changing work area design to create proper storage areas for tools, equipment, and materials.
- Tools and equipment should be provided to clean up waste (brooms, dust pans, vacuums, etc.).
- Factories should assign responsibilities for the following:
  - clean up during the shift
  - day-to-day cleanup
  - waste disposal
  - removal of unused materials

Electrical Safety

Purpose

Accidental contact with electric current may result in electric shocks, contact burns and even death, if proper protective measures are not taken. Wiring and electrical systems such as sockets, panels, motors, fuse boxes, and transformers that are not well maintained can overheat and become a fire hazard. The purpose of this section is to help reduce threats to workers, equipment, and buildings from electrical shock or electrical fires.

Requirements

IA Factories must maintain wiring and electrical systems in safe condition.

- All electrical wires must be properly insulated.
- All electrical junction boxes must be covered.
- Ground Fault Circuit Interrupter (GFCI) is used areas where moisture is present or humidity is high.
- All electrical connectors must be in good condition.
- Violation may be rated **CI** if general wiring condition is good, management systems are in place, and certified electrician maintains electrical systems on a daily basis.

IA Factories that have electrical responsibility within the facility are required to have regular electrical safety training. Written records must be kept of this training.

IA All electrical equipment must be properly grounded.

IA Permanent and stationary equipment must have hardwired electrical connections only.

IA Electrical panels are labeled and breakers identify the equipment they protect.

Implementation of Requirements

Training, Rules and Record Keeping

- Provide maintenance workers with electrical safety training when they are first hired, and make sure they are retrained each year after that.
- Only those workers that have been trained and authorized may work with electrical systems.
- Factories should keep written records to show this training has been completed.

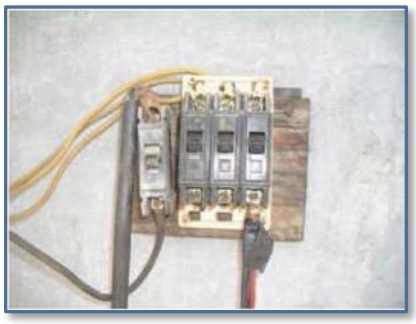
Hazard Assessment

- Perform regular inspections of equipment and electrical installations to make sure they are in good working condition and do not present electric shock or fire hazards.

- Identify each piece of equipment or machinery that presents electrical or mechanical hazards to maintenance workers. Contact the equipment manufacturer to obtain appropriate electrical safety information, if necessary. Prepare a written procedure for de-energizing and locking and tagging each machine out before performing any maintenance on it. (See the LOTO interactive training program identified in "Further Information" section below.)

Hazard Controls

- Grounding is an electrical connection to earth. A ground wire carries electrical current to earth when there is a leak in a circuit. Use building ground for all AC outlets, motor grounds, etc. Never use the neutral circuit wire as the electrical ground.
- A Ground Fault Circuit Interrupter (GFCI) is an electrical breaker that protects against an accidental short or overload of an electrical circuit. This device trips, cutting off electrical current at the slightest indication of an electrical short. Ground Fault Circuit Interrupters should be used in areas where there is moisture or humidity is high (for example, outlets close to water hose line, water faucets, etc.).
- Regularly test and maintain electrical panels, tighten electrical connections, and test electrical motors at "full load" (maximum electrical current or amperage) to identify loose connections that may create a fire hazard.
- Use adequate wire size and connectors, according to current load, for temporary electrical connections. Undersized wire or loose connectors are the most common causes for wire overheating that may lead to fire hazards. Temporary installations should be kept only for a length of time specified by the work.
- Label and identify electrical panels as to the type of voltage (480V / 220V; 240V / 120V, etc.). Label each circuit breaker.
- Electrical panels should always be closed and locked. Keys for electrical panels should be kept in a centralized area and made available only to authorized personnel.
- Make sure there is easy access (approximately 1 meter or 3 feet) to electrical panels and transformers. Do not allow electrical panels or transformers to be blocked by equipment or stored materials, and keep flammable or combustible materials away.



(IA) Circuit breaker with exposed and damaged wiring! Circuit breakers must be labeled and enclosed.

- To reduce the risk of electrical shock, cap or otherwise close any openings left in electrical enclosures (electrical panels, boxes, etc.) from removed electric piping, circuit breakers, etc.
- Before using portable cord and plug-connected equipment and extension cords on any shift, inspect them for defects such as loose parts, deformed and missing pins, or

damage to the outer jacket or insulation. Do not allow the use of damaged or defective equipment or cords. Such items should be repaired (if possible) or discarded.

- Avoid hanging electric extension cords from the ceiling, if possible. If these are to be used, make sure to have a strain relief mesh or similar device to prevent strain on the outlet or damage to the extension cord.

Control of Hazardous Energy / Lock-Out/Tag-Out

Purpose

"Control of hazardous energy" refers to the practices and procedures that are needed to disable machinery or equipment to prevent it from unexpectedly re-energizing or starting up while workers perform servicing and maintenance activities on it. These types of controls (typically referred to as "Lock-Out/Tag-Out") prevent many deaths and injuries each year. The purpose of this section is to describe requirements for control of hazardous energy that will help make sure servicing and maintenance activities are safely performed.

Requirements

IA Factories must have written lock-out/tag-out and maintenance procedures to keep maintenance personnel and equipment operators safe during operations such as maintenance, un-jamming of machines, needle changes, or changing of dies or machine parts.

IA Each piece of machinery or equipment must have its own electrical, pneumatic, or hydraulic disconnect switch or valve so that the individual machine or piece of equipment can be isolated from the others.

IA Before a worker may be authorized to lock out and tag out equipment, he/she must be trained in lock-out and tag-out techniques and procedures by experienced personnel.

Implementation of Requirements

Training, Rules and Record Keeping

- Factories should make sure that new equipment, or modification and repairs done to existing equipment, includes the capability of having all energy sources locked out (rather than simply tagged out).
- Factories should establish and maintain lock-out or tag-out procedures that are specific for each piece of equipment that requires service or maintenance. Procedures should provide for group lock out (using a group lock-out device to which individuals lock their personal devices), for the orderly transfer of lock-out devices during shift changes, and for emergency removal of locks.
- Factories should provide authorized workers with standardized lock-out/tag-out devices and a reliable means of locking or tagging equipment
- In addition to the training in Requirements above, factories should provide training to all workers who operate or work with machinery and equipment on the related hazards, including electrical hazards.
- Conduct training and maintain records of the:
  - Annual program assessment

- Annual Inspection checklist (see Appendix)
- Annual Certification Form (see Appendix)
- Training for all machine operators/workers and for those authorized to do lock-out/tag-out work.
- Inform any contractors working on equipment of the lock-out / tag-out procedures and the requirement to follow them.

Hazard Assessment

- Factories should identify the types of activities and the machines and equipment that require lock-out/tag-out of hazardous energy sources, including new equipment. Make sure new or modified equipment is capable of having all energy sources locked out (rather than simply tagged out).
- Factories should evaluate the lock-out/tag-out program each year, to make sure there are proper lock-out/tag-out procedures for machines and equipment that require them and that workers are following these procedures.

Hazard Controls

- Factories should create and use procedures for safe service and maintenance of equipment. These procedures will differ for equipment that is cord-and-plug connected. Below are procedures for powering off and servicing cord-and-plug connected equipment and for general lock-out / tag-out of equipment. Factories should write specific procedures for individual devices or equipment.

Power-Off Procedure For Cord- and Plug-Connected Electric Equipment

The following procedure applies to work to be done on electric equipment which is connected to its energy source by a cord and a plug. By unplugging the equipment from the energy source (electrical outlet) and having control over that plug, the worker performing the service or maintenance prevents unexpected reenergizing or start-up of the equipment.

1. Stop work and turn the control switch to the “OFF” position.
2. Unplug any electrical power sources, and keep the plug under your control.
3. Wait for all machine or equipment action to stop.
4. Test equipment to make sure the machine has stopped (e.g., depress treadle, push hand controls).
5. Perform the service or maintenance task (e.g., needle, bobbin changes), and do not place any part of the body in a dangerous location or position.
6. Reinstall all removed safety devices.
7. Plug the equipment back into the energy source and turn the control switch to the “ON” position to test and ensure adjustments were correctly performed.

General Lock-Out/Tag-Out Procedure

1. Identify the primary equipment to be maintained, and any additional equipment associated with it.
2. Review the specific lock-out/tag-out procedure(s) for the device or equipment.
3. Notify the workers (e.g., operator, team members, and supervisors) who use the equipment or work around it that lock-out/tag-out and maintenance work is to be performed.
4. Turn the equipment off (follow normal shut-down procedures).
5. Isolate all associated energy sources and discharge the stored energy until you have achieved a zero state (e.g., bleed all pressurized lines, discharge electrical circuits).
6. Block and/or restrict all machine parts that may move and therefore pose a hazard during maintenance work.
7. Attach a tag to the affected equipment.
8. Attach a lock to isolate equipment from energy sources.
9. Turn the machine's power sources on as a test. The equipment should not be operable and any stored energy should be completely discharged.
10. Turn equipment power sources back to the "OFF" position.
11. Complete service, repairs, and/or adjustments.
12. Restore equipment to service:
    - Replace all covers and safety devices.
    - Inspect equipment.
    - Verify all workers are clear of the equipment.
    - Remove locks and tags.
    - Turn equipment energy source(s) back to the "ON" position.
    - Test equipment for proper function.
13. Notify affected workers that equipment is ready for use and lock-out/tag-out is no longer in use.

Machine Guarding

Purpose

Machine guards can prevent injuries to workers caused by machine hazards such as moving parts, high temperatures, and lasers. Workplace injuries that may be caused by machine hazards include crushed fingers or hands, amputated fingers or hands, burns, and blindness. The purpose of this section is to explain the requirements for machine guarding to help prevent such injuries.

Requirements

IA All machinery with exposed, moving, mechanical parts must be equipped with safety devices. For these parts, all required protective guards must be in place.

CI Workers should be given machine guarding safety training on the machines they operate.

CI Factories should assess the hazards of new and existing equipment to determine whether existing guards are effective in protecting workers, or if other machine guards should be added to control hazards.

CI Factories should routinely inspect equipment to make sure equipment guards are in place and working properly.

Implementation of Requirements

Training, Rules and Record Keeping

- Anyone who will be operating or servicing machines that may pose safety hazards should first be trained on the specific procedures for safely operating or servicing the equipment. They should be trained about the hazards of the equipment and about how to use machine guards to operate the equipment safely. (See Appendix.)
- Factories should keep written records of equipment service.

Hazard Assessment

- Check any new equipment (that is, powered or power transmission equipment) to make sure that it has the right machine guards for the hazards it poses.
- Make and keep a list of the equipment that has machine guards. Include the equipment location, the type of equipment and the type and numbers of machine safeguards on the equipment.
- Factories should keep written records to show this training has been completed.

Hazard Controls - General

Good Practice: Grinding wheel with eye shield in place

- Guards should be made of metal or, where visibility is required, they may be made of sturdy plastic or safety glass.
- Guards may be made of wood in areas where materials are present (acids and bases) that would corrode (wear away) a metal guard.
- Nip points on conveyors should be guarded.
- Steam irons and fabric presses should have handle and pedal guards to protect the operator's arms and legs from burns.
- Work areas should be arranged to protect workers from contact with surrounding equipment, such as the cables for steam irons.

Hazard Controls – Machine/Maintenance Shops

- Eye shields should be installed on grinding wheels to prevent flying objects from injuring the operator.
- Grinding wheels should be permanently secured to a bench top.
- Tool rests and tongue guards should be installed and properly adjusted on grinding wheels to safely direct any flying objects away from the operator.
- Cutting blades and other points of operation on workshop machinery should be guarded to prevent wood chips, splinters, or pieces of a broken cutting blade from flying off the equipment and injuring the operator.
- Belt-sanding machines should have guards at each nip point where the sanding belt runs onto a pulley.
- All portable, power-driven, circular saws with blades greater than 5 cm (~2 inches) in diameter should have guards.
- The lower guard of a portable, power-driven, circular saw should automatically and instantly return to cover the blade when the saw is not in use.
- Machine tools should be bolted to the floor so they don't tip or fall when operated.

H*azard Controls – Sewing Factories*

- All sewing machine needles should have needle guards to prevent injuries to the operator from broken needles. Sewing needles that are permanently protected by fabric folders or guides do not require the needle guards.
- Operators should wear safety glasses when operating sewing equipment unless the machines have eye shields.
- Moving machine parts and drive belts should be guarded at the point of operation (the area where the machine performs work). In a fabric cutter, for example, the point of operation is where the blade contacts (and cuts) the fabric.

Hazard Controls – Laundry Facilities

- Laser-etching machines should have barrier guards and interlocks to keep operators from opening them while the laser is on. Interlocks will automatically shut off the machine if the barrier guard is removed or opened.
- Gears, drive belts, and other moving parts on washers and dryers should be guarded.

Powered Industrial Trucks

Purpose

Powered industrial trucks can cause serious injury to operators and co-workers if they are not properly maintained or if operators are not properly trained. Equipment collisions can also damage property and interrupt production. The purpose of this section is to help make sure that workers are properly trained and qualified to operate powered industrial trucks.

Powered industrial trucks include the following:

- Forklifts
- Material pickers
- Turret trucks
- Golf carts
- Lowboys
- Highboys
- Powered hand trucks

Requirements

IA Only authorized workers, who have been properly trained and evaluated, may operate or maintain powered industrial trucks.

CI Each powered industrial truck should be inspected at the beginning of every shift to make sure it:

- functions properly and safely, and
- does not create hazards.

CI All workers who use, adjust, or maintain powered industrial trucks should be trained to perform these jobs safely.

CI All industrial truck operators should complete the requirements for re-qualification periodically. Operators' safety performance should be evaluated frequently.

CI Industrial truck operators should be re-trained and disciplined if the operator has been:

- observed to operate the equipment in an unsafe manner or involved in an accident or near-miss incident

Note: *Industrial truck operators shall be re-trained if, at any time, they are assigned to drive a different type of equipment, or there are changes in the workplace that affect the safe operation of the equipment.*

CI All powered industrial trucks should have audible back up alarms while in reverse.

CI Factories should make sure that all contractors, vendors and visitors that may use powered industrial trucks understand that they should become qualified to use this equipment and how to meet the qualification requirements.

Implementation of Requirements

Training, Rules and Record Keeping

- All workers should be instructed that they may not use or maintain powered industrial trucks unless they have been trained and are qualified to do so:
- Operators of powered industrial trucks should be trained and qualified for the specific equipment they operate or maintain.
- Training should include:
  - Formal instruction (e.g., lecture, discussion, interactive computer learning, videotape, written material)
  - Practical or hands-on instruction (e.g., demonstrations by the trainer, exercises done by the trainee)
  - Observation and evaluation of the operator's performance with the equipment in the workplace
- Operators should pass written and operational tests to be qualified to operate powered industrial trucks.
- Trainers should have the knowledge and experience to train equipment operators and evaluate their ability to safely operate powered industrial trucks.
- Factories should certify that each powered industrial truck operator has been trained and has passed the qualification test. The written certification should include the: (a) operator's name, (b) training date, (c) date of evaluation, and (d) trainer's name.
- Equipment operators should be re-tested at least every 3 years. The re-qualification test evaluates:
  - the operator's prior knowledge and skill,
  - the types of equipment he or she will operate in the workplace,
  - the types of hazards in the workplace, and
  - the operator's ability to operate the equipment safely.
- Operators who pass the re-qualification test should be re- qualified for at least three years. Current operators who do not pass the re-qualification test should be re-trained, following the requirements for the initial training program. Operators may not use powered industrial trucks until they have been formally re-qualified.

Hazard Assessment

- Factories should make sure there is a procedure in place that requires workers to inspect each powered industrial truck at the beginning of every shift to make sure it is in good working condition.

Hazard Controls

- If, during a pre-use inspection, an operator finds that a powered industrial truck is not working properly, he or she should inform a supervisor and should not operate the vehicle until it has been repaired and it is safe to do so.
- Factories should make sure that powered industrial trucks are serviced and maintained on a regular schedule.

Noise Management

Purpose

Permanent hearing loss may be caused by a number of things, including disease, aging, sudden loud noise or long-term exposure to loud noise. The purpose of this section is to describe requirements to manage workplace noise levels to help prevent workers from experiencing work related hearing loss.

Requirements

IA Factories must identify workers who work in areas with noise levels that are higher than 85 decibels. These workers must wear hearing protection and be trained on the proper use of hearing protection and the health and safety risks of not wearing hearing protection. Factories must supply workers with the necessary hearing protection (ear plugs, ear muffs). Factories must keep written records that show this training has been completed.

IA Factories must meet legal requirements to test workers' hearing to determine whether they have experienced any hearing loss.

CI Factories should conduct noise hazard evaluations each year to identify any areas where noise levels exceed 85 decibels.

CI Factories should first attempt to reduce noise levels that are higher than 85 decibels through proper maintenance of equipment and engineered noise controls.

Implementation of Requirements

Training, Rules and Record Keeping

- Workers in areas where noise levels are higher than 85 decibels should have an audiometric test to determine if hearing loss has occurred. This test should be conducted at 2000, 3000, and 4000 Hz frequency range for both ears.
- Warning signs should be posted in areas where noise levels exceed 85 decibels, telling workers (and visitors) that the area is a "Mandatory Hearing Protection" area.
- Factories should keep records of noise monitoring results.

Hazard Assessment

- Noise levels within buildings should be monitored each year to determine which areas (if any) exceed 85 decibels.
- Noise output on new equipment should be evaluated and engineered controls used to reduce noise.

Hazard Controls

- Where noise levels are higher than 85 decibels, factories should provide workers with hearing protection, such as earplugs or ear muffs with a noise reduction ratio of 20. Workers should be trained and required to wear the hearing protection.
- Where noise levels are higher than 85 decibels, factories should use engineered controls to reduce noise levels, including:
  - Rubber padding to reduce machine vibration
  - Sound barriers
  - Noise curtains
  - Sound-absorbing materials
  - Enclosures
  - Sound insulation
- Noise levels should not exceed a 140-decibel peak sound pressure level at any time.

Personal Protective Equipment

Purpose

Personal protective equipment (e.g., safety glasses, ear plugs, safety shoes) is worn by workers to prevent or minimize exposure to workplace hazards. Personal protective equipment must only be considered as a hazard control measure after all practical engineering controls (e.g., enclosing equipment to make it quieter, installing ventilation equipment to remove air contaminants, etc.) and administrative controls (e.g., limiting the amount of time workers may do a task) have been used and there still remains a need for additional protection. The purpose of this section is to describe the requirements for proper use of personal protective equipment.

Requirements

IA Factories must try to lower noise levels by properly maintaining equipment, installing rubber padding, etc. In areas where noise levels remain higher than 85 decibels, factories must supply workers with hearing protection (such as earplugs or ear muffs) that has a noise reduction ratio of 20. Workers must be trained to properly use the hearing protection and must be required to wear it. In addition, factories must designate these areas as "Mandatory Hearing Protection" areas by posting signs. (See the Noise Management section.)

CI Factories should supply workers who do potentially hazardous work (e.g., drilling, sanding, grinding, construction, loading or materials handling) with suitable personal protective equipment.

- Factories should supply cutting room workers with metal mesh gloves, train workers to use them properly, and require that they be worn.
- Workers should wear shoes or boots that will protect against foot injury.
- Factories should provide workers with protective eyewear to guard against flying objects, glare (e.g., from laser usage), liquids, dust, etc. Prescription lenses typically do not provide enough protection. Eyewear should meet the applicable standard for impact resistance (see, for example, ANSI Z87.1-1989) and should not disturb the proper positioning of prescription lenses.
- Sewing factories should provide finger guards for sewing workers to protect against needle punctures.

CI Factories should train these workers to use protective equipment properly and require that it be worn. Factories should inform workers about the health and safety risks of not wearing required personal protective equipment.

CI PPE storage areas should be kept clean and factories should practice good housekeeping in these areas.

Typical Personal Protective Equipment

- Eye protection such as safety glasses or goggles to guard against flying objects and dust.
- Face shields to protect against chemical or hot metal splashes, flying chips and sparks, heat and other hazards. These are often made of a heavy-duty plastic that is attached to a visor that should shield the entire face (and often shield the head and neck, as well).
- Hearing protection such as ear muffs and ear plugs for noise levels that exceed 85 decibels. (See Noise Management section.)
- Head protection such as hard hats and bump/laceration caps. These protect against impact from falling, moving, flying objects and from knocking into objects. They also serve to protect workers from rain or other weather elements.
- Hand/Arm protection such as finger guards, thimbles, gloves, and sleeves. Fingers, hands, and arms should be protected from exposure to cuts, scratches, bruises, burns, and chemicals. Appropriate personal protective equipment should be used for the specific hazard.
- Aprons are worn to protect the body from chemical splashes.
- Foot protection such as safety shoes with guards designed to protect against impact, crushing injuries and punctures. Where acids, bases, lubricants, water and other liquids are used, workers should wear slip-resistant and/or chemical resistant shoes.
- Respiratory protection such as masks to protect against dust, and air-purifying respirators to protect against chemicals, dusts or vapors. The appropriate respirator type should be selected for the specific hazard and it should be tested to make sure it fits the wearer. Medical exams and training should be completed before a worker may wear any respirator.

Implementation of Requirements

Training, Rules and Record Keeping

- Factories should choose suitable protective equipment for the hazards identified in the assessment (see "**Hazard Assessment**" below), provide workers with it, and require them to use it.
- Factories should train workers who are required to wear personal protective equipment on the following:
  - when the equipment is necessary,
  - what equipment is necessary (and required),
  - how to use and adjust the equipment,
  - limitations of the equipment, and
  - proper care and maintenance of the equipment.
- Factories should regularly review how well the personal protective equipment program is working and take action to improve it, if necessary.

Hazard Assessment

- Factories should review and assess the workplace to identify hazards that require the use of personal protective equipment. (See the Risk Assessment section.)

Hazard Controls – Sewing Factories

- Operators should make sure that needle guards, eye shields, and machine guards are in place.
- Pressing and ironing operators should wear gloves, sleeves, and face shields (when appropriate) to protect against burns.
- Shoes with hard, non-slip soles should be worn to avoid puncture wounds from needles, pins, etc.
- While cutting fabric, workers should wear metal mesh gloves.

Hazard Controls – Laundry Facilities

- Laundry facilities should make sure that operators of laser etching machines are provided with and required to wear laser safety glasses.
- Workers using chemicals and dyes should wear eye/face protection, gloves, and protective clothing such as aprons to protect them from chemical splashes.
- Laundry facilities should make sure there is adequate ventilation to protect workers from breathing toxic dusts or vapors. Respirators should be used only when an area cannot be ventilated properly.

Hazard Controls – Machine/Maintenance Shops

- Workers should wear eye/face protection when drilling, sanding, grinding, welding, etc. to avoid contact with flying sparks, chips, and other objects.
- Mechanics should wear safety shoes to protect their feet from falling tools or heavy parts.
- When using (or cleaning up) any chemical, workers should follow recommendations for personal protective equipment that are outlined on the Material Safety Data Sheet.

Hazard Controls – Shipping and Receiving

- In areas where feet can be crushed by forklifts, carts, or dropped materials, workers should wear safety shoes.
- Leather or puncture-resistant gloves should be worn when handling pallets.

Ventilation

Purpose

The purpose of this section is to make sure that ventilation is used properly to remove air contaminants from the workplace to protect workers' health.

Requirements

IA Chemical mixing must take place in a well-ventilated or open area, using appropriate personal protective equipment.

IA Factories must use ventilation that directs air flow away from workers for tasks such as welding, or handling or mixing chemicals.

IA Ventilation system must be provided in abrasive-blasting workshop and spraying workshop.

- Air flow is directed away from workers
- Exhaust is directed away from air intakes
- Exhaust is directed away from people living near the factory or other factories.

CI Ventilation system should be provided in all chemical storage areas.

CI Ventilation system should be checked and regularly maintained.

Implementation of Requirements

Hazard Assessment

- Factories should periodically evaluate the ventilation system to check that it is working effectively.

Hazard Controls – Sewing Factories

- Factories should never discharge contaminated air flow close to (or at the same level as) a heating, ventilation, or air conditioning vent or an open area where exhausted fumes might be drawn back into the building through a make-up air unit, by fans, etc.
- In areas where friable asbestos-containing material is present, factories should never use forced ventilation or any ventilation that disrupts the asbestos-containing material. (See Asbestos section for the definition of "friable" and a description of the important role of a qualified contractor in evaluating workplace asbestos-containing material.)
- Factories should make sure that welding areas have a local exhaust ventilation system or forced ventilation to direct the air flow away from workers.
- Factory ventilation systems should use mechanical or electronic air filters to remove particles, and activated charcoal filters to remove gases and vapors.

Further Information

- See Finishing Safety Guidelines.
- Guidance on selecting general and local exhaust ventilation systems is available at: http://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_3.html .

Chemical Management

Purpose

Chemical "handling" includes activities such as pouring or measuring chemicals, transporting chemicals within the factory, adding chemicals to equipment, and disposing of chemicals. Safety measures, including the use of safety equipment, safe work practices and personal protective equipment (PPE), help workers avoid potentially hazardous exposures to chemicals. Proper storage of chemicals minimizes the risk of accidentally mixing incompatible chemicals. (For example, contact between a concentrated oxidizing acid and a flammable solvent would likely result in a fire or explosion.)

The purpose of this section is to describe the requirements for proper handling and storage of chemicals in order to protect worker health and safety, as well as factory equipment and building structures.

Note: Chemical disposal is covered in the Hazardous Waste topic.

Requirements

IA Factories must develop and implement a procedure for storing chemicals in an organized way, following guidelines for storage compatibilities (see the Appendix) to avoid contact between incompatible chemicals and providing for secondary containment, where necessary to prevent release to the environment.

IA Factories handling chemicals must have immediate access (within 10 seconds) to an eyewash station and shower that can be operated without the use of hands. Once an eyewash station is turned on, it must continue to flow without requiring a worker to operate it with his/her hands. Workers must have both hands available to hold open their eyes if they require a flushing.

IA Factories must meet legal requirements to notify government or other local agencies (such as fire departments) about chemicals used or stored onsite.

IA Chemical storage areas must have the following safety features:

- Safety shower/eye wash nearby, within a 10 second walk
- Spill kits with materials for containment and absorption
- Fire-fighting equipment, fire hoses and/or fire extinguishers
- Signs indicating PPE required to work in area
- Secondary containment, with the capacity to hold 110% of the largest volume.
- Aisles and forklift routes are clearly marked

IA Employees who work with chemicals must be provided with appropriate face and body protection (such as respirators, safety glasses, gloves or clothing) as specified in the SDS and training in proper chemical handling and emergency procedures. In addition, employees must be required to wear PPE if indicated by the SDS.

IA Chemicals and chemical containers must be disposed of properly and in accordance with all legal requirements.

IA All chemicals must be properly labeled in the language(s) spoken by workers. Violation may be rated (**CI**) if the factory has a good chemical management system in place and the violation is immediately corrected.

IA Chemicals must be stored and used in designated areas which are well ventilated.

CI Chemical storage areas should be kept clean and factories should practice good housekeeping in these areas.

CI Safety Data Sheets should be kept on site, available in the language(s) spoken by workers, and should be available for review by workers.

Good Practice: Chemicals stored in designated area. Area is clean and housekeeping is good.

Implementation of Requirements

Training, Rules and Record Keeping

- The chemical inventory should be kept onsite and updated whenever a process is changed and a new chemical is used and/or an existing chemical is no longer used.
- Training for workers who handle chemicals should cover the hazard and safety information provided in an SDS, the meaning of symbols on signs and labels, and ways to protect themselves from hazards, including proper chemical storage and the use of safety equipment, safe work practices, emergency and spill response procedures, and personal protective equipment. Factories should keep written records that show this training has been completed.
- Signs written in the spoken language(s) of workers should be posted in the appropriate locations if PPE use is required. (See the Signs and Labels topic.) Signs prohibiting smoking should be posted in chemical storage areas. Chemical storage areas should also have signs that indicate the type of chemical stored there (e.g., corrosive, flammable, toxic, oxidizing substances).

Good Practice: Proper signs and labels.

- Material Safety Data Sheets (SDS) for each chemical used at the factory should be kept on site and located so that workers have easy access to them.
- All containers, including secondary containers, must be labeled with the identity of the chemical(s) they contain and a brief warning phrase or symbol indicating the chemical's hazard(s) (e.g., "Caution—Flammable"). The NFPA 704 Hazard Identification diamond or the HMIG (Hazardous Material Information Guide) label are examples of labels that may be used to meet this requirement.

Hazard Assessment

- Factories should assess chemical handling and storage areas to identify hazards and hazard controls (see the Risk Assessment topic). SDSs should be reviewed as a part of this process.
- Factories should routinely inspect areas where chemicals are stored and handled to make sure they meet the requirements.

Hazard Controls – Sewing Factories

- Factories should identify and require appropriate PPE (such as respirators, safety glasses, gloves, or clothing) for workers who handle chemicals, based on the hazard assessment, the information contained in the SDS, and on local regulatory standards or other acceptable chemical exposure limits (see the Occupational Exposure Limit topic). See the Personal Protective Equipment topic for more information.
- If an air-purifying respirator is required for work with a specific chemical or chemicals, factories should ensure that workers are provided with the appropriate, protective respirator cartridges to match the chemical. The following web site provides information about cartridges appropriate for different types of chemicals:
  - http://is.gd/bIYnI (3M Company Catalog)
- Factories should make first aid kits available in chemical handling areas. See the First Aid topic in the "Health Guidelines" section for more information.
- Factories should provide supplies and equipment for cleaning up chemical spills. These supplies should be located close to chemical handling and storage areas.
- Fire-fighting equipment, including a water hose and fire extinguisher, should be provided in chemical storage areas.
- Aisles and forklift routes should be clearly marked in chemical storage areas.
- Liquid propane gas tanks/cylinders, acetylene tanks, and chemical storage areas should be safely located away from sources of heat and flammable materials. In addition, they should be stored at a reasonable (safe) distance from workers.
- All outside chemical storage should be covered to protect steel drums from corrosion and to prevent plastic drums from deteriorating.
- Chemical gas cylinders should be stored in a well-ventilated area—preferably outside. They should be stored upright and secured (with chains) to a fixed object to prevent them from falling over. Gas cylinders should be stored away from ignition sources.

- Caps and lids on all chemical containers should be kept tightly closed to prevent evaporation of contents.
- Flammable storage cabinets should be used to store flammable liquids.
- Chemicals stored in amounts greater than 200 liters (~100 kg) should have secondary containment. (Secondary containment is a container or other structure outside the primary container that is used to keep chemicals from leaking onto building or equipment surfaces.) The secondary containment should be able to hold 110% of the largest stored chemical volume.
- Chemical containers should not be stacked any higher than three (3) meters. Chemical drums should always be stacked with the closure device upward. Drums should be stacked fewer than four (4) drums high, preferably with pallets between layers. Side-mounted drums should be chocked to prevent them from rolling.

Good Practice: Secondary storage is segregated and well lighted.

Bad Practice (IA): Secondary containment is too small for these chemical drums!

Extreme Temperatures

Purpose

Under extreme conditions of temperature, humidity, airflow, and workload, workers may experience heat or cold stress, which is the body's attempt to maintain a normal body temperature. Factory conditions that are very hot or very cold may cause workers to suffer from a variety of heat or cold stress symptoms, including heat cramps, heat exhaustion, heat rash, heat stroke, frostbite and hypothermia. Heat stroke (from extreme heat) and hypothermia (from extreme cold) are both conditions that may lead to death, if not treated immediately. The purpose of this section is to describe the requirements for safely working in extremely hot or cold temperature conditions.

Requirements

IA Proper personal protective equipment must be provided to workers who work in operations involving extreme heat or cold. Ovens and pressing machine are examples of operations that may require additional PPE.

IA Before a worker begins work in an extremely hot or cold job, a physical exam must be conducted to determine whether he/she is fit to work in such conditions.

IA Factories must have satisfactory temperature controls and must provide a working environment that does not routinely expose workers to excessive heat or cold.

IA Plenty of water must be available for workers who work in areas with high temperatures (near ovens, dryers, etc.).

IA Workers who work in extremely hot or cold job must be trained to recognize and respond to the symptoms of heat or cold stress.

IA Reasonable shifts and rest breaks planning must be taken into account the type of work (light, moderate, or heavy) and the temperature and humidity conditions.

Implementation of Requirements

Training, Rules and Record Keeping

- Anyone who works around equipment or works in an area that may be extremely hot or cold should first be trained to recognize the symptoms of heat or cold stress and should be trained to respond to these symptoms. (Symptoms may include nausea, fatigue, dizziness, confusion and irritability, among others.) These workers should also be given five days to gradually adjust to conditions of extreme heat or cold.
- Workers should be trained to give first aid to other workers who may be showing stress symptoms from working in extremely hot or cold temperatures. Factories should keep written records to show that training been completed.

Hazard Assessment

- Make sure that thermometers are working properly.
- Evaluate whether a job scheduled to be done during an extremely hot or cold time of day can, instead, be done when the temperature is more comfortable.
- Plan rest breaks that take into account the type of work (light, moderate, or heavy) and the temperature and humidity conditions.
- Consider a worker's physical condition when determining his or her fitness to work in hot or cold environments.
- Before a worker begins work in an extremely hot or cold environment, make sure he/she has had a physical exam to determine whether he/she is fit to work in such conditions.

Hazard Controls

- Make sure that equipment to control high or low temperatures is in place and working properly. This equipment may include ventilation, heaters, air conditioning, cooling fans, shields, and insulation.
- Make sure workers have personal protective equipment to protect against heat stress when they work around hot equipment (e.g., ovens, dryers, etc.) or to protect against cold stress when they work in cold temperatures.
- Allow new workers to have a five-day period to adjust to extreme temperature conditions. Similarly, give this five-day adjustment period to workers who have been away from work for two weeks or more.

Good Practice: Typical fan used to cool workspace.

- Allow workers to have adequate recovery time when they are working in areas of extreme heat or cold. Rest breaks should take into account the type of work (light, moderate, or heavy) and the temperature and humidity conditions.
- Offer plenty of drinking water (as much as a quart per worker per hour) to reduce the risk of heat stress.
- Where there is a chance that workers will suffer heat stress caused by hot equipment, workers should wear clothing that reflects heat (aprons, jackets, suits, etc.). Any reflective clothing should be worn loose to allow air flow through it. Workers wearing such clothing should be careful to avoid trapping it in machinery with moving parts.

Asbestos Management

Purpose

Asbestos is a naturally-occurring mineral that has been mined and used in numerous ways because it is fire resistant, chemical resistant, and a good insulator. Asbestos has been used in building materials such as floor and ceiling tiles, pipe insulation, sprayed fireproofing, roofing products, sealants, mastics, and gaskets. Asbestos fibers may be released into the air if the asbestos-containing material ages and starts to fall apart or if it is disturbed by sanding, sawing, or other activity. Some types of asbestos fibers, if they are released into the air, may enter the lungs and cause serious illness, including cancer. Exposure to asbestos fibers is especially hazardous for smokers. The purpose of this document is to provide guidance to reduce or avoid worker exposure to asbestos fibers in the air.

Requirements

IA Factories must have an asbestos management program and must work closely with a qualified contractor to:
- train workers,
- inspect building areas for asbestos-containing materials, and
- create safe work practices, clean-up procedures, and a plan to prevent the release of asbestos into the air.

IA Factories must make a list of areas that are known to have, or may have asbestos-containing materials.

IA Factories must review and comply with applicable asbestos laws and regulations.

IA Damaged building materials that may contain asbestos must be sampled and tested by qualified consultants and laboratories to determine whether they contain asbestos and what additional action is needed.

CI Maintenance workers should be trained to recognize materials that may contain asbestos.

Good Practice: Asbestos-coated pipes are properly marked.

CI Asbestos-containing materials should be properly marked. If a qualified contractor decides that it is not necessary to remove these materials, the factory should have a procedure to inspect them, periodically, to make sure these materials remain in good condition.

CI If a qualified contractor finds that the asbestos-containing material contains "friable" asbestos (defined in the Appendix), a qualified contractor should repair, enclose, or remove the material according to applicable laws and regulations.

CI Factories should review purchases of new building materials to make sure they do not contain asbestos.

Implementation of Requirements

Training, Rules and Record Keeping

- Maintenance workers should receive asbestos training when they are hired, and should be retrained each year after that.
- Factories should keep written records to show this training has been completed.
- A factory's list of building areas that are known to have, or may have, asbestos-containing materials should include the location, description, and condition of all asbestos-containing materials.

Hazard Assessment

- All areas of the factory building (e.g., mechanical areas, common areas, work areas, laundries, kitchen) should be inspected for asbestos-containing materials. Both friable and non-friable asbestos-containing materials should be identified.
- Each year, the physical condition of any asbestos-containing materials should be evaluated and any changes should be noted and included on the list referred to in the Training, Rules, and Record Keeping section.

Hazard Controls

- Factories should establish procedures to ensure that workers and work practices do not damage or disturb asbestos- containing materials, which might release asbestos fibers into the air.
- Signs should be posted to indicate the location of asbestos- containing materials.
- All asbestos waste should be labeled before disposal.
- Containers used to dispose of asbestos waste should be properly sealed.

Occupational Exposure

Background

Workers may be exposed to chemicals in the work place by, for example, inhalation or skin contact. Government agencies (such as the United States Occupational Safety and Health Administration, OSHA), and other organizations (such as the American Conference of Governmental Industrial Hygienists, ACGIH) have published limits to protect workers from adverse effects which may occur from excessive exposure to certain chemicals. These limits are often referred to as "occupational exposure limits" (OELs) and are referenced in Safety Data Sheets (SDS, previously known as Material Safety Data Sheets (MSDS). The nature of the work varies from factory to factory, and may change within a factory during the course a typical year. If any of the chemicals listed below, or any other chemicals, are used in the factory, industrial hygiene monitoring (which measures chemical exposure) shall be used to determine whether exposure is in conformance with the applicable OEL.

Industrial hygiene monitoring, which measures chemical exposures, shall be used to determine whether exposures are acceptable or whether they exceed the local legislation limits or available standard or OSHA listed OELs.

Purpose

The purpose of this section is to emphasize the factory's obligation to ensure compliance with all applicable OELs and to conduct and pay for industrial hygiene monitoring. The contracting factory shall obtain sufficient analytical information regarding its workplace so that factory management can better ensure that no one in the workplace suffers injury or occupational illness. Factory shall comply with OELs set by local authorities or, in case local regulation does nott exist, factory shall use the best available standard.

Requirements

IA Factory shall comply with the OELs listed in this section or with those set by local authorities, whichever are more stringent. Regardless of whether it is listed below, if there is potential for worker exposure in excess of the applicable OEL, factory shall conduct appropriate industrial hygiene monitoring.

IA Factory shall continually review tasks, operations and conditions to determine whether the nature of the work involves exposure to chemicals and, if so, include those chemicals in an industrial hygiene monitoring plan and monitor annually. Factory must recognize that processes may change, thereby bringing into play new chemicals for which representative industrial hygiene monitoring has not been conducted at the factory (in which event industrial hygiene monitoring must be conducted).

IA Factory shall use qualified industrial hygienists to conduct industrial hygiene monitoring under worst-case conditions (e.g. maximum work load) and use qualified laboratories to analyze and report on the samples. The names and contact information for the industrial hygienists and laboratories, and the results of the industrial hygiene monitoring shall be provided to TOE assessor.

IA Factory shall make available for the industrial hygienist all required information such as all MSDS/SDS which have been received. These materials shall be kept for evidence.

IA Factory shall perform annual industrial hygiene monitoring assessment for TOE approval - as a minimum - for the following substances if they are used at the factory in any of the activities listed below:

Footwear Occupational Safety

- Assembling, curing
  - Benzene
  - n-Hexane
  - Ethyl acetate
  - Methyl ethyl ketone
  - Toluene
  - Others if identified on SDS
- Cutting and Brushing
  - Respirable leather dust

Apparel Occupational Safety

- Cutting, hand scraping, brushing and damaging
  - Respirable dust
- Spraying
  - Manganese
  - Formaldehyde
- Dipping/sponging
  - Formaldehyde
  - Manganese
- Oven curing
  - Formaldehyde
- Solar curing
  - Formaldehyde
- Ozone depletion
  - Ozone
- Cryonomic treatment
  - CO2
- Screen printing
- Formaldehyde
  - Brushing
- Respirable dust
  - Chemical storage
- SDS to be reviewed

IA If personal air monitoring discovers employee exposure at or above 10% of the 8-hour TWA, the involved factory must repeat processes at least once a year under worst- case conditions (potential conditions that would be expected to lead to the highest worker exposures).

IA Each factory shall also measure employee exposures promptly, upon receiving reports of complaints from workers or symptoms related to specific substance. The factory shall inform the TOE assessor of any such report or complaint.

IA Factory shall establish a procedure to reduce chemical exposures to ensure compliance with the applicable OEL, must the industrial hygiene monitoring results indicate this is necessary. This procedure shall include effective application of engineering controls work practices and/or personal protective equipment. Once controls have been implemented, factories must re-evaluate exposures to determine whether the controls have reduced worker exposures below the applicable OEL.

Implementation of Requirements

Hazard Controls

IA Factory shall identify and require appropriate PPE (such as respirators, safety glasses, gloves, or clothing) for workers who may have exposures to chemicals above the occupational exposure limits. See the Personal Protective Equipment topic for more information. Factories must evaluate the use of engineering controls (such as improved ventilation) as well as work practices (e.g., limiting the amount of time employees work with a chemical) to reduce chemical exposure levels below the OELs.

Training, Rules and Record Keeping

CI Industrial hygiene monitoring results shall be disclosed to workers and reports made available on request to the TOE Assessor. Factories should archive hygienic reports for 40 years, or as specified in the local legislation, whichever prevails.

Hazard Assessment

CI Factory shall establish a plan to conduct industrial hygiene monitoring that includes steps to (1) identify which chemicals it uses that also have OELs (most commonly-used chemicals do); (2) evaluate tasks and conditions in which those chemicals are used; and (3) prioritize chemicals for industrial hygiene monitoring. Evaluations of tasks and conditions should consider the manner in which the chemicals are used (e.g., potential for vapors or for splashing), the controls already in place (such as ventilation), and the duration and frequency with which workers use the chemicals.

CI The industrial hygiene monitoring plan should be updated periodically, based on changes to the chemical inventory and the results of previous industrial hygiene monitoring.

Signs and Labels

Purpose

The purpose of this section is to make sure that factories properly communicate work area hazards and chemical hazards by posting the appropriate signs and labels. The Appendix provides examples of internationally recognized safety and warning signs and symbols.

Requirements

CI Factories should establish a procedure for using signs and labels to communicate workplace hazards.

CI Workers should be trained to recognize and understand the meaning of the hazard warning signs and labels in use at the factory.

CI Factories should routinely inspect all signs and labels to make sure they (a) are in place and (b) are maintained in good condition, visible, and functioning as intended.

CI Factories should ensure there are an adequate number of signs and labels to communicate hazards. In addition, signs and labels should be:

- Displayed clearly
- Large enough to be visible to those intended to see them
- Written in a language (s) that can be understood by all workers
- Constructed so they resist corrosion and weather effects

CI Essential signs (such as emergency exits) should be illuminated so they are visible when it is dark or foggy, or if there is smoke. These signs should be properly maintained, replaced and/or removed as necessary or when no longer valid.

Implementation of Requirements

Training, Rules and Record Keeping

- Workers should be trained to recognize and understand the hazard warnings provided by signs and labels. Factories should keep written records of such training.
- Factories should make and keep a list of the areas and equipment that require signs and labels. Include the specific location, the type of equipment (including chemical containers), and the type and numbers of signs and labels.

Hazard Assessment

- Factories should review the hazards in each work area to make sure that signs and labels are being used correctly to warn workers of these hazards. (Also see the Risk Assessment topic.)
- Building areas should be inspected each month to make sure signs and labels are in place, displayed clearly and well maintained.

- Factories should periodically request input from workers and management about the effectiveness of the signs and labels in work areas.

Hazard Controls – Printing Workshop, Laundry Workshop & Chemical Warehouse

- Post warning signs and labels in these areas.
- Provide signs and labels that provide specific safety instructions for the chemicals that workers handle.
- Provide signs requiring workers to use the proper PPE.

Hazard Controls – Cutting Workshop

- Provide signs requiring workers to wear the proper PPE (such as metal gloves and dust-protective masks).

Hazard Controls – Sewing and Dry-Finishing Workshop

- Provide signs requiring sewing workers to use eye guards and needle guards on their machines.
- Provide signs requiring workers to use hand-protection devices on the button-punching machines.
- Ensure that chemicals are properly labeled and provide signs instructing spot-cleaning workers on how to safely use them.
- Provide signs requiring workers to use proper PPE.

Hazard Controls – Generator Workshop, Embroidery Workshop & Boiler Workshop

- Post signs warning workers that hearing protection is required in these areas.
- Post signs indicating these are restricted areas and that workers should be authorized to enter them.

Hazard Controls – Waste Water Treatment Plant

- Post signs indicating this is a restricted area and that only authorized workers may enter it.
- Ensure that chemicals are properly labeled and provide signs instructing workers on how to safely use them.
- Provide signs requiring workers to use proper PPE.

Maintenance

Purpose

Maintenance is a set of organized activities that are carried out to keep factory buildings and equipment in safe and effective operational condition. The purpose of this section is to make sure that maintenance-related activities, whether they are performed by internal maintenance teams or external contractors, are performed safely. The main objectives are to keep the workplace, its structures, equipment, machines, furniture and facilities operating properly and safely.

Requirements

ZTV Specialized maintenance tasks can be performed only by authorized and skilled personnel.

IA Maintenance teams are provided with appropriate information regarding any risk that is associated with their tasks.

IA Maintenance teams prepare and follow appropriate procedures to address whatever risk is associated with their tasks, and are fully trained regarding those procedures.

IA External contractors prepare and follow appropriate procedures to address whatever risk is associated with their tasks, being sure to comply with the most stringent applicable safety standards.

Implementation of Requirements

IA Maintenance work can be complex and difficult and involve diverse circumstances. The recommended approach is to establish two maintenance groups: building maintenance (the preventive and remedial upkeep of building components such as (HVAC, electrical, plumbing, elevators, carpentry and painting), and equipment maintenance (equipment related to the manufacturing process).

Risk assessment and safety working procedures associated to the task

IA An assessment of risk must be prepared for each maintenance task, and that assessment must be provided to and understood by all maintenance workers.

IA Safe working methods, including safety checklists and inspection frequency, must be specified for all maintenance tasks

IA Non- exhaustive list of procedures expected to be implemented in suppliers' premises: roles and responsibilities, training and communication, prevention of

alcohol and drugs, work at heights, electricity, machinery, external contractors, raking systems, work in confined spaces, use of personal protective equipment, asbestos, lock-out & tag-out, chemicals storage and management, workshop equipment, welding, hazardous waste management, manual handling, fork lift trucks.

Training, Rules, and Record Keeping

IA Employees involved in maintenance must be trained to identify hazards, assess their risks, and evaluate the effectiveness of control measures.

IA Close supervision and enforcement are essential to achieve a fully safe environment, and it is the responsibility of all employees promptly to report any condition or behavior which they believe to be unsafe.

IA Training and education must account for process and technological change.