## Isocyanates

1. **Purpose**

To identify and reduce or eliminate the incidence of adverse health effects associated with occupational exposure to isocyanates.

1. **Responsibilities**

The Field Foreman shall:

* Review the Isocyanates program with affected personnel and ensure the program is enforced in the workplace.

The Environmental, Safety, and Health Department shall:

* Coordinate the overall isocyanates program.
* Provide isocyanates program training and training materials.

1. **General**

* Isocyanates are widely used in the manufacture of flexible and rigid foams, fibers, coatings such as paints and varnishes, and elastomers, and are increasingly used in the automobile industry, auto body repair, and building insulation materials. In addition, spray-on polyurethane products containing isocyanates have been developed for a wide range of retail, commercial, and industrial uses to protect cement, wood, fiberglass, steel, and aluminum, including protective coatings for truck beds, trailers, boats, foundations, and decks.
* Employees shall not be exposed to airborne concentration of isocyanates that exceeds the OSHA permissible exposure limit (PEL) of 0.02ppm ceiling or 0.005 TWA.
* No person shall enter an area where isocyanate concentrations are known or suspected to be 0.02 parts per million (ppm) by volume in air at the employees breathing zone without wearing a self-contained breathing apparatus.
* All contract personnel shall be required to comply with the isocyanates safety requirements in this safety program.
* Where there is a potential exposure to isocyanates, an assessment of the worksite shall be conducted prior to entry or work commencing to determine the presence of isocyanates. The worksite assessment shall determine the risk controls to be set in place to prevent employee exposure beyond the OEL/PEL of isocyanates.

1. **Risk Controls**

Risk controls are a critical step in preventing employee exposure to isocyanates in the workplace.

* + The most effective control to reduce the risk of exposure to isocyanates is to eliminate the source of exposure. Where possible, substitute the use of a hazardous substance with a safer material.
  + Engineering controls such as closed systems and ventilation should be the principal method for minimizing isocyanate exposure.
  + Other controls, such as worker isolation, housekeeping, personal hygiene, and the use of personal protective equipment may also be necessary.

1. **Health Effects**

* Isocyanates are powerful irritants to the mucous membranes of the eyes, nose, throat, and gastrointestinal and respiratory tracts. Irritation may be severe enough to cause bronchitis, pneumonitis, asthma, and death.
* The signs and symptoms of isocyanate overexposure include coughing, tightness of the chest, shortness of breath, nausea, vomiting, eye and skin irritations, gastric pain and loss of consciousness.
* Dermal (skin) contact with isocyanates can cause irritation, rash, hives, swelling, and necrosis.
* Continuous overexposure to isocyanates can lead to pulmonary sensitization or "isocyanate asthma." When this occurs, symptoms can improve when the irritant is removed. However, acute severe asthma attacks can occur on renewed exposure, even when the encounter is very brief or at low levels of isocyanates.

1. **Training**

Safety training shall be provided for all personnel who may be required to work in a known or suspected isocyanate environment. This training must be given prior to working in an isocyanate environment. The following areas must be covered in the training program:

* Activities, items, and processes that may involve isocyanate exposure.
* Use and limitations of respiratory protection equipment.
* The choice, inspection, and use of personal protective equipment.
* Risk control methods to reduce employee exposure.
* Health hazards and effects of isocyanate exposure.
* Signs and symptoms of isocyanate exposure.
* First aid procedures and equipment.
* Our policy, procedures, and isocyanate locations.
* All personnel who work in or may be required to work in an isocyanate area shall complete a refresher course in isocyanate safety annually.
* All training shall be documented.
* Contractors shall document and provide verification of such training of their employees upon request.

1. **Personal Protective Equipment (PPE)**

* Before the start of each job, a hazard assessment shall be performed to determine if isocyanate hazards are present or are likely to be present, and which necessitates the use of PPE. The hazard assessment shall be documented with certifier’s name, signature and date.
* When isocyanate hazards are present, PPE will be selected for each affected employee. Selection and reasons for selection should be given to the employee. Selected PPE must be fitted to each affected employee.
* All PPE must be provided used and maintained in a sanitary and reliable condition. The equipment should be properly cleaned, inspected after use, and stored in clearly marked and properly designated areas. It is the employer’s responsibility to ensure that employee owned equipment is adequate, properly used and maintained.
* Any equipment that no longer provides adequate protection should be repaired or replaced immediately. Defective or damaged equipment shall not be used.

1. **Respiratory Protection**

* Respiratory equipment will be provided to all employees that may be exposed to concentration levels of isocyanates beyond the TWA PEL or ceiling limits. Respirators shall be used when engineering control measures are not feasible during routine operations and during emergency situations. Respirators must be one of the approved by the National Institute of Occupational Safety and Health (NIOSH)
* Selection of specific products for use in specific applications shall be made by a qualified person and all equipment should be appropriately fitted, used and maintained according to AS/NZS1715 “Selection, use and maintenance of respiratory protective devices”.
* Employees who are either required to wear respiratory protect, must pass a medical exam provided before being permitted to wear a respirator on the job. Employees are not permitted to wear respirators until a physician has determined that they are medically able to do so. Any employee refusing the medical evaluation will not be allowed to work in an area requiring respirator use. A licensed physician where all company medical services are provided will provide the medical evaluations.
* Qualitative fitting test shall be used to determine the ability of each individual respirator wearer to obtain a satisfactory fit with a respirator. The qualitative fit testing method is outlined in 29 CFR 1910.134 Appendix A. This protocol shall be strictly adhered to when performing qualitative fit testing.
* A fit test must be performed on all respirators that incorporate a face seal, regardless of whether they are positive or negative pressure respirators.
* The results of respirator-fitting tests shall be used to select specific types, makes, and models of respirators for use by individual respirator wearers.
* A respirator-fit test shall be carried out for each respirator wearer at least annually.
* The respirator-fit test shall be documented using a standardized form.

Fit testing shall not be performed until the respirator wearer has passed a respirator user medical evaluation.

1. **Medical Surveillance**

A medical surveillance program shall be established whenever personnel have the potential for exposure to isocyanate levels at or above the TWA PEL or ceiling limit. The following guidelines shall be followed for medical surveillance:

* All medical examinations and procedures will be performed by or under the supervision of a licensed physician and are to be provided without cost to personnel at a reasonable time and place.
* A medical assessment will be available prior to initial assignment, annually thereafter, and upon exit from the company for employees who may be exposed to isocyanates in the workplace.
* The medical assessments shall place special emphasis on the respiratory tract, past respiratory conditions, work history related to respiratory concerns, and spirometry testing.
* Isocyanate-sensitized employees should be assigned to work in areas where exposure to isocyanates is not expected.
* Employees who have pre-existing respiratory conditions shall be notified of the potential for increased health risks associated with isocyanate exposure.

All employees shall be informed of their right to access medical and exposure records, the existence, location and availability of employee exposure and medical records maintained by or for the Company and the person responsible for maintaining and providing access to these.

* Initial notification should be covered in the new employee orientation. A copy of the bulletin board notification and/or copy of this standard can be used and should be documented.
* Annual notification can be made by posting a notice where the employees gather outlining the program.
* The employee may access his/her records by making a request to the Human Resources Manager.
* A written request must be provided to the Human Resources representative to initiate access to these records.
* Employees, previous employees and designated representatives have the right to review and/or copy relevant Company exposure and medical records. There shall be no cost for this service.

1. **First Aid Treatment**

* Activate the Emergency Response Plan.
* Always don an SCBA before entering a potential isocyanate area, then remove victim to a safe area and begin artificial resuscitation.
* Initiate CPR if circulation has stopped.
* Treat for shock (keep the victim warm).
* Ensure personnel overcome by isocyanates are examined by a physician.