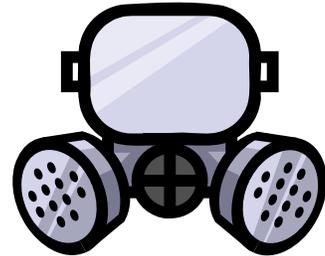


# SECTION TWO – MIOSHA REGULATIONS

## PART 2: MIOSHA HEALTH REGULATIONS

### CHAPTER 20: Air Contaminants

The ***MIOSHA General Industry Occupational Health Standards- Part 301, Air Contaminant Rules (R 325.51101-51108)*** are administered by the Michigan Department of Labor and Economic Growth, MIOSHA. The air contaminant rules set permissible exposure limits for approximately 600 substances. MIOSHA permissible exposure limits (i.e., PEL's) may or may not be the same as federal OSHA's, Michigan's PELs must be equal to or more stringent than federal OSHA's. Permissible exposure limits set by these rules include:



- The time-weighted average (TWA) represents the employee's average airborne exposure in any eight-hour work shift of any 40-hour work week which shall not be exceeded.
- The short-term exposure limit (STEL) represents the employee's 15-minute TWA exposure which shall not be exceeded at any time during a work day unless another time limit is specified for the contaminant.
- A ceiling limit is the employee's exposure which shall not be exceeded during any part of the work day. If instantaneous monitoring is not feasible, the ceiling shall be assessed as a 15-minute, TWA exposure which shall not be exceeded during any part of the work day.

Permissible exposure limits for some commonly used chemicals are as follow:

Chemical	TWA	STEL
Acetone	750 ppm	1,000 ppm
2-butoxyethanol	25 ppm	
Toluene	100 ppm	150 ppm
1,1,1-Trichloroethane	350 ppm	450 ppm
Xylene	100 ppm	150 ppm

#### 20.1 Employee Exposure

As an employer who uses hazardous chemicals in the workplace, you should evaluate your employees' potential exposure to these chemicals. Key elements of a hazard evaluation will provide you with the knowledge to determine which materials must be monitored for exposure purposes. (This evaluation may be coordinated with your facility's pollution prevention efforts.) Steps that should be considered in the evaluation include:

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- 20.2 – Monitoring
- 20.3 – Engineering Controls
- 20.4 – Administrative Controls and Personal Protective Equipment

## SECTION TWO: MIOSHA Regulations

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- Determining the physical, chemical, and toxicological properties of the hazardous material.
- Quantifying the amount of product that is used and the rate at which gases or vapors are generated.
- Determining the length of exposure.
- Considering the decomposition of products and other types of hazards such as skin absorption or ingestion.
- Evaluating the location of the hazard and existing engineering controls.
- Seasonal considerations. Volatile compounds will produce more vapors as the temperature of the work place increases during summer months. Dilution ventilation during cold months typically decreases as buildings are closed up to minimize heat loss.

### 20.2 Monitoring

The best method of evaluating your employee exposure to hazardous chemicals is achieved by conducting personal monitoring. Personal monitoring means the sample is collected as close as possible to the exposed employee's breathing zone.

Area monitoring (collecting the sample from an area of the plant where employees are exposed to hazardous chemicals) can be conducted in some circumstances to provide general information pertaining to the likelihood of overexposure of employees to regulated permissible exposure limits. However, area monitoring can produce inaccurate results if the sample is not collected from a proper location.

Monitoring of air contaminants can be conducted in a variety of ways. These include:

- Use of direct reading instruments which provides instantaneous or continuous analytical results.
- Use of personal monitoring devices which are either passive or active. Active devices utilize a pump to draw air through some type of collection media. The collection media is then sent to a laboratory for analysis. There are specific, recognized procedures for collection and analysis of air contaminants which must be followed to ensure reporting of accurate results.
- Use of detector tubes, which are a type of passive or active monitoring device, provides inexpensive, quick, and relatively accurate analysis of contaminant levels in the work place.

The MIOSHA, Consultation Education and Training Division, provides professional on-site assistance, free of charge, to aid employers in evaluating employee exposure to air contaminants.

### 20.3 Engineering Controls

When employee exposures to an air contaminant exceed the permissible exposure limit, without regard to the use of respiratory protection, the employer must institute available and feasible (i.e., economically, structurally, etc.) engineering controls to reduce exposures below the

permissible exposure limit. If exposures cannot be reduced below the permissible exposure limit, engineering controls, in conjunction with personal protective equipment, shall be used to attain the lowest exposure levels feasible. Types of engineering controls may include:

- Bringing in large volumes of fresh air to dilute the concentrations of hazardous material, referred to as dilution ventilation.
- Use of local exhaust ventilation to capture and remove the hazardous material at its point of emission or source. Use of filters, cyclones, absorbents, and scrubbers may be necessary components of such a ventilation system. These are used to capture the contaminant in the exhausted air prior to venting the air to the outdoor environment or recirculating some or all of the air back into the work place.
- Construct an enclosure around the employee or the process which uses the hazardous material.



Contact the Michigan Department of Environmental Quality, Clean Air Assistance Program, at (800) 662-9278 prior to exhausting air to the outdoor environment. Permits may be required (see Chapter 1.1).

Additionally, consult ***MIOSHA General Industry Occupational Health Standards – Part 520, Ventilation Control (R 3101)*** prior to recirculating any air from exhaust systems back into the work place.

## 20.4 Administrative Controls and Personal Protective Equipment

If engineering controls do not reduce the exposures below the permissible exposure limit, you must rely on administrative controls and personal protective equipment to reduce exposures.

Administrative controls are work practices or policies instituted by the employer to reduce employee exposure to air contaminants. Many of the water and air pollution prevention strategies addressed in previous chapters are also effective controls for your employees' exposures to workplace contaminants.

The last line of defense against airborne contaminants is personal protective equipment (see Chapter 16). This control measure is not considered as effective as engineering controls because the hazard still exists and you are relying on the employee to properly use the personal protective equipment to prevent exposure. Types of personal protective equipment include respirators, hearing protection, and chemical protective clothing. Personal protective equipment should only be used to control exposures to contaminants (including noise):

- When engineering or administrative controls are not available or feasible (or, if these controls are installed but are not enough to reduce exposures below the personal exposure limit).
- During the time period that engineering controls are being installed.
- During emergencies.