



## Policy

Saskatoon & Area - Occupational Health & Safety

**Number:** 53-022

**Title:** Physical Hazard: Plume during Work Procedures

**Saskatchewan Employment Act:** 3, 4, 9, 13

**OHS Regulation:** 6-2, 6-3, 6-22, 7-2, 7-8, 7-13, 31-3

**Date:** January 1, 2017

**Date Revised/Reaffirmed:** December 30, 2021

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### Purpose

To ensure engineering, administrative and PPE controls are in place to prevent exposure to hazardous plume created during work tasks

### Definition

“**Plume**” is defined as a noxious airborne contaminant generated as by-products, particularly by procedures that rely on the ablation, cauterization or mechanical manipulation of target tissue by devices such as lasers, electrosurgical generators, broadband light sources, ultrasonic instruments and bones saws.

- Plume can contain a variety of contaminants, including viable bacteria, viruses, cellular debris, particulates, noxious and toxic aerosols, gases, vapours and fumes (including fumes from metals). The gases can include toxic substances such as benzene formaldehyde and hydrogen cyanide. Energy-based contact with articles such as tubing, swabs and skin preparation solutions will produce additional chemical.
- Plume can also contain aerosolized blood (plasma and blood cells or fragments of cells) and blood-borne pathogens in the form of bacteria and viruses. In vitro studies of bacterial and viral contamination have found viable *Escherichia coli*, *Staphylococcus aureus*, human papillomavirus (HPV) and human immunodeficiency virus (HIV) in plume.
- Plume thus poses a hazard to exposed persons and can transmit infection. The contaminants in plume can cause respiratory problems or have mutagenic or carcinogenic effects. They can also cause mucousmembrane, ocular, respiratory and skin irritations and reduce the clinician’s ability to visualize the operative field, resulting in unsafe operation conditions.

### Roles and Responsibilities

Employer must ensure:

- That all tasks that will create a plume exposure control plan, detailing the controls in place to prevent exposure to the plume, including:
  - Engineering controls to capture the plume including local exhaust ventilation such as plume scavenging system
  - Administrative controls including safe work procedures, training and maintenance
  - Personal Protective Equipment appropriate for the kind of contaminant and type of exposure

Manager/Supervisor must ensure:

- Workers are educated to understand the risk associated to plume, the procedures that may create plume and how to reduce the risk
- That roles and responsibilities of all workers are being met, as well as applicable legislation and/or standards
- That all tasks that will create a plume have controls in place to prevent exposure to the plume, including:
  - Engineering controls to capture the plume including local exhaust ventilation such as plume scavenging system
  - Administrative controls including safe work procedures, training and maintenance
  - Personal Protective Equipment appropriate for the kind of contaminant and type of exposure
- Work does not proceed until effective controls are in place
- Equipment is inspected and maintained according to the inspection and maintenance schedule
- All workers they supervise are trained and comply in the use of the equipment, safe work procedures and PPE required to prevent exposure to a plume
- Appropriate PPE is available for all workers

Worker must ensure:

- They participate in the educate designed to inform them of the risks of plume, procedures that may create plume and how to prevent exposure
- They have received training related to tasks that create plume
- They are trained in and follow the safe work procedures
- They are trained in and use any PPE required (selection, use, care and handling)
- They understand their roles and responsibilities in regards to plume
- They use all controls that have been put in place to prevent exposure to a plume
- They inspect all equipment designed to prevent exposure to plume before use
- They will not perform tasks that will create plume, unless effective controls are in place
- They report to their supervisor and the Safety Alert System/Incident Report Line for any incidents or near misses involving uncontrolled exposure to plume

### **Orientation & Training**

- Training in all policies and procedures related to plume
- Training on use and care of appropriate PPE

### **Materials**

- Appropriate PPE as required

### **Non-Compliance/Breach:**

Non-compliance with this policy will result in a review of the incident. A review for non-compliance may result in disciplinary action, up to and including termination of employment or privileges; fines and /or prosecution of individuals under the Saskatchewan Employment Act and OHS Regulations.

### **References**

- CSA Z305.13-09 Plume scavenging in surgical, diagnostic, therapeutic and aesthetic settings

Review Dates:

January 1, 2017

June 7, 2018

December 30, 2021