

# **Plume scavenging in surgical, diagnostic, therapeutic, and aesthetic settings**



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# Preface

This is the second edition of CSA Z305.13, *Plume scavenging in surgical, diagnostic, therapeutic, and aesthetic settings*. It supersedes the previous edition published in 2009.

This Standard was prepared by the Subcommittee on Plume Scavenging, under the jurisdiction of the Technical Committee on Perioperative Safety and the Strategic Steering Committee on Health Care Technology, and has been formally approved by the Technical Committee.

## Notes:

- 1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*
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# CSA Z305.13:13

## ***Plume scavenging in surgical, diagnostic, therapeutic, and aesthetic settings***

### **0 Introduction**

Certain surgical, diagnostic, therapeutic, and aesthetic techniques can generate noxious airborne contaminants (plume) as by-products, particularly from procedures that rely on the ablation, cauterization, or mechanical manipulation of target tissue by devices such as lasers, electro-surgical generators, broadband light sources, ultrasonic instruments, plasma generators, bone saws, and drills.

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 chemicals.

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 mucous membrane, ocular, respiratory, and skin irritations and reduce the clinician's ability to visualize the operative field, resulting in unsafe operating conditions.

### **1 Scope**

#### **1.1**

This Standard applies to systems and equipment used to capture and evacuate plume. It applies to all settings where such systems and equipment are used, including, but not limited to, the following:

- a) surgical facilities;
- b) dental clinics;
- c) medical offices;
- d) veterinary facilities;
- e) laboratories and other research and testing facilities;
- f) cosmetic treatment facilities;
- g) teaching facilities;
- h) manufacturing facilities; and
- i) professional exhibitions and trade shows.