

# Artificially Created Fog and Haze – Production Memo

Actsafes Safety Bulletin #10a

Artificial fog and haze are commonly generated using a fog or haze machine that releases a chemical solution as an airborne aerosol to produce various effects during filming or performing. This bulletin provides recommendations for reducing worker exposure to hazards created by chemicals generated when using artificial fog and haze.

## HEALTH EFFECTS

If fog and haze levels are kept below occupational exposure limits (OELs), there are no known long-term effects for healthy adults. However, every individual is different, and temporary reactions to artificial fog or haze can range from having no effects to one or more of the following:

- Eye irritation
- Dry or sore throat
- Respiratory irritation, coughing
- Sinus irritation

### Individuals at higher risk

OELs apply to healthy adults. Productions should take steps to minimize exposure to older workers, children, pregnant women, workers with respiratory conditions, or anyone who may have a higher sensitivity to artificial fog and haze. These individuals should advise a supervisor, the production, or a first aid attendant of any concerns.

When infants (under two years old) are present, the production should take appropriate steps to prevent them from being exposed to artificial fog or haze.

## GUIDELINES AND EXPOSURE LIMITS

Various chemical solutions and mixtures are used to generate artificial fog or haze. Some ingredients have OELs that are regulated by WorkSafeBC.

### Chemicals to avoid

Products containing the following chemicals should not be used because of their possible health effects:

- Aromatic and aliphatic hydrocarbon mixtures
- Ethylene glycol and diethylene glycol (DEG)
- Hexachloroethane
- Cyclohexylamine
- Fumed and hydrolyzed chlorides

### Cryogenics

Cryogenics such as liquid nitrogen or carbon dioxide (dry ice) should not be used in enclosed spaces or low-lying areas. When they are used, adequate fresh air should be supplied to prevent oxygen depletion and the creation of a hazardous atmosphere.

### Commonly used chemicals

Products containing the chemicals listed in the following table have established OELs. The airborne OELs (specified in milligrams per cubic metre) should not be exceeded unless exposure



# Artificially Created Fog and Haze – Production Memo

## Actsafes Safety Bulletin #10a

controls are in place. As exposure time increases, the allowable exposure limit decreases. The table includes OELs for 8-hour shifts, 12-hour shifts, and

peak level (which is the highest level of exposure that can occur four times in a day with at least one hour in between exposures).

Ingredient	8-hour OEL (mg/m <sup>3</sup> )	12-hour OEL (mg/m <sup>3</sup> )	Peak (mg/m <sup>3</sup> )
1,3-butylene glycol, 1,2-butylene glycol, propylene glycol, triethylene glycol, polyethylene glycol, dipropylene glycol	10	5	40
Total glycol	10	5	40
Glycerin (total)	10	5	50
Glycerin (respirable)	3	1.5	15
Mineral oil (highly refined only)	1	0.5	5

## PRODUCTION REQUIREMENTS

Productions have the following responsibilities:

- Consult with the joint health and safety committee and production safety representative — for example, when creating or reviewing safe work procedures for fog or haze. Inform them of the intended use, and ensure that proper documentation and safety equipment (e.g., respirators, ventilation) are available.
- Ensure that fit testing has been conducted if respirators are required.
- Inform background performers in advance that fog or haze is going to be used, and specify it on the call sheet.
- Only use qualified special effects technicians to generate artificial fog or haze.
- Ensure that technicians follow manufacturers' guidelines for equipment use and that they only use fluids and gases specified by manufacturers. Technicians should not mix their own solutions or use unapproved equipment.

## CONTROL MEASURES

Consider the following control measures to minimize exposures:

- When possible, eliminate the need for artificial fog or haze.
- If artificial fog or haze is being used, limit the number of performers and crew who are exposed to it. If their presence is not required, keep them clear of the area.
- Consult safety data sheets (SDSs) before using artificial fog or haze products. SDSs must be readily available at the worksite.
- Limit the duration of exposure. If workers (e.g., camera operators and stand-ins) are exposed for extended durations, additional control measures may be required.
- Use ventilation and exhaust mechanisms to keep levels below OELs. If ventilation is turned off during filming, make sure it is turned back on as soon as possible.
- Monitor airborne levels to ensure that they do not exceed OELs.
- If airborne monitoring is not conducted, then ensure that exposure estimates are available (based on previous monitoring reports, available literature, or professional health and safety advice).
- Provide areas where performers and crew can access fresh air.



# Artificially Created Fog and Haze – Production Memo

## Actsafes Safety Bulletin #10a

- Appropriate respirators must be provided if the concentration or duration of exposure exceeds the OELs.
- Fit testing is not required when air concentration levels are below the OELs, and a worker chooses to voluntarily wear a respirator, but respirator training is still required

## SAFETY COMMUNICATIONS

Safety information such as the following must be communicated to performers and crew:

- Possible health effects of exposure to fog or haze (e.g., eye irritation, dry throat, respiratory irritation)
- When and where fog or haze will be used
- How to minimize exposure
- Ventilation procedures that are in place to ensure there is adequate fresh air
- Availability and how to use respiratory protection if airborne levels are expected to exceed the OELs.
- Who to contact if you experience any signs of health effects from exposure

## MEASURING AIRBORNE CONCENTRATIONS

Monitoring should be conducted by or under the direction of a qualified person. Consider contacting an industrial hygienist or other qualified person to discuss measuring airborne concentrations,

correction factors, and testing. Various direct-reading instruments that measure airborne aerosols are available to rent or purchase.

## RELATED REFERENCES

- [Sections 5.48–5.59, Controlling Exposure](#)
- [Section 5.50, Extended work periods](#)
- [Section 8.5, Program](#) (describes requirements that apply to respirator programs)
- [Sections 8.32–8.45, Respirators](#)

## RELATED RESOURCES

- [Artificially Created Fog and Haze — Call Sheet Memo](#) (safety bulletin 10)
- [E-Limit search tool for exposure limits](#) (WorkSafeBC)

### Actsafes Safety Association

Actsafes is a not-for-profit health and safety association supporting British Columbia's arts and entertainment industries. Actsafes provides resources and training to employers, workers, and supervisors. We are always here to provide information relevant to best practices around health and safety in the arts and entertainment industries in B.C.

**Disclaimer:** The information contained in Actsafes's products (including, but not limited to, our training materials and courses) is for educational purposes only and is not intended to provide legal or other advice to you. Actsafes's products are not a substitute for obtaining appropriate legal or other advice from legal or other professionals. Actsafes's products have been developed based on information available as of the date of preparation. Actsafes does not make any warranty or representation as to the accuracy or completeness of information contained in its products or the suitability of such information for any purpose. Neither Actsafes Safety Association nor any person or entity involved in the production of Actsafes's products shall be liable for any loss, injury, claim, liability or damages of any kind resulting from the use or reliance on the product for any purpose.

Website: [www.actsafes.ca](http://www.actsafes.ca) | Email: [info@actsafes.ca](mailto:info@actsafes.ca)

