



# SHAPE SAFETY BULLETIN #10A

(Safety & Health In Arts Production & Entertainment)

## AIR QUALITY

1. When choosing a filming or recording location, the producer must determine whether there are health risks for the members of the production crew and make the necessary corrections when the air quality does not meet the standards in *WorkSafeBC OHS Regulation Part 4.7 Indoor Air Quality* and *Part 5 Chemical and Biological Agents*.

2. If gases, dusts, smoke or vapours are produced during filming or recording, the producer must ensure compliance with the standards relating to concentrations and times in *WorkSafeBC OHS Regulation 5.48 through 5.59 Controlling Exposures*.

If a substance referred to under WorkSafeBC regulation [section 5.48](#) is provided only with an 8-hour TWA limit, the employer must, in addition to the requirement of section 5.48, ensure that a worker's exposure to the substance does not exceed (a) three times the 8-hour TWA limit for more than a total of 30 minutes during the work period, and

(b) five times the 8-hour TWA limit at any time.

(i) If the work period is more than 8 hours in a 24 hour day, the 8-hour TWA limit must be reduced by multiplying the TWA limit by the following factors:

Factor	Length of work period (in hours)
0.7	more than 8, but not more than 10
0.5	more than 10, but not more than 12
0.25	more than 12, but not more than 16
0.1	more than 16

(ii) For some substances with an extended biological half-life, with written permission from the Board, a factor other than those in subsection (1), or a time-weighted averaging period other than 8 hours may be used to accommodate extended work periods, provided that any such adjustment is based upon recognized occupational hygiene principles, and provides adequate protection from adverse health effects.

3. When the air quality standards cannot be complied with, the producer must supply the members of the production crew with respiratory protective equipment. The crew must be trained how to use, inspect and fit their respirator (*WorkSafeBC OHS Regulation Part 8 Personal Protective Equipment Sec. 8.32 through 8.45 Respiratory Protection*.)

4. Before any equipment, machinery or work process is put into operation the persons responsible for doing so must ensure that:

(a) safeguards and air contaminant controls required by this WorkSafeBC Regulation are in place and functioning, and

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- (b) no person will be exposed to undue risk by putting the equipment, machinery or work process into operation.

**When are respirators required?**

The employer must provide appropriate respiratory protective equipment if a worker is or may be exposed to concentrations of an air contaminant in excess of an applicable exposure or excursion limit, or to an oxygen deficient atmosphere.

**Selection**

- (1) The employer, in consultation with the worker and the occupational health and safety committee, if any, or the worker health and safety representative, if any, must select appropriate respiratory protective equipment in accordance with *CSA Standard CAN/CSA-Z94.4-93, Selection, Use, and Care of Respirators*.

Only respiratory protective equipment which meets the requirements of a standard acceptable to the Board may be used for protection against airborne contaminants in the workplace.

**Note:** NIOSH approved respirators are acceptable to the Board.

**(2) Protection factors**

A respirator must not be used for protection against concentrations of an air contaminant greater than the maximum use concentration, which is the concentration determined by multiplying the exposure limit for the air contaminant by the appropriate respirator protection factor selected from Table 8-1, or as otherwise determined by the Board.

**Table 8-1: Respirator protection factors**

Respirator type	Protection Factor
<b>Air purifying</b>	
Half facepiece, non-powered	10
Full facepiece, non-powered	50
Full facepiece, powered (PAPR), equipped with HEPA filters for exposure to asbestos	100
Full facepiece, powered (PAPR), equipped with HEPA filters and/or sorbent cartridge or canister for exposure to contaminants other than asbestos	1 000
Loose-fitting facepiece, powered (PAPR)	25
<b>Air supplying</b>	
<b>Airline - demand (negative pressure)</b>	

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Half facepiece	10
Full facepiece	50
<b>Airline - continuous flow</b>	
Loose-fitting facepiece/hoods	25
Half facepiece	50
Full facepiece	1 000
Helmet/hood	1 000
<b>Airline - pressure demand (positive pressure)</b>	
Half facepiece	50
Full facepiece	1 000
Full facepiece, with egress bottle	10 000
<b>Self-contained breathing apparatus (SCBA)</b>	
Demand (negative pressure)	50
Pressure demand (positive pressure)	10 000
Other factors such as warning properties, IDLH levels, and cartridge/canister limitations must also be taken into account when determining the maximum use concentration. Refer to the manufacturer's instructions and standards acceptable to the Board for further information.	

*[Amended by B.C. Reg. 20/2006, effective May 17, 2006.]*

**IDLH or oxygen deficient atmosphere**

Consult your studio/employer's policies before entering an IDLH (Immediately Dangerous to Life or Health) or oxygen deficient atmosphere.

(1) If a worker is required to enter or work in an IDLH or oxygen deficient atmosphere the worker must:

- (a) wear a full facepiece positive pressure respirator which is either an SCBA, or an airline respirator with an auxiliary self- contained air cylinder of sufficient capacity to permit the worker to escape unassisted from the contaminated area if the air supply fails, and
- (b) be attended by at least one other worker stationed at or near the entrance to the contaminated area who is similarly equipped and capable of effecting rescue.

(2) Subsection (1)(a) applies if there is a significant risk of accidental release into a worker's breathing zone of quantities of an air contaminant sufficient to produce an IDLH atmosphere.

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### **Emergency escape respirators**

(1) If the nature or quantity of an air contaminant and the nature of the work area could prevent a worker escaping from a contaminated area without assistance, the worker must carry an emergency escape respirator.

(2) The emergency escape respirator must be:

- (a) carried on the worker's person or be within arm's reach at all times, and
- (b) sufficient to permit the worker to leave the contaminated area without assistance.

### **Corrective eyewear**

(1) If a worker who wears prescription eyeglasses is required to wear a full facepiece respirator, the employer must assess the work to be performed, and provide appropriate specialty corrective eyewear if necessary to ensure that the work can be performed safely.

(2) The employer may permit the use of contact lenses by a worker who is required to wear a full facepiece respirator if their use is not likely to adversely affect the health or safety of the worker.

### **Face seal**

(1) Except for specialty eyewear approved by the Board for use with positive pressure full facepiece respirators, nothing is permitted which intrudes between the facepiece and the face, or which interferes with the face seal of the facepiece.

(2) A worker required to wear a respirator which requires an effective seal with the face for proper functioning must be clean shaven where the respirator seals with the face.

### **Fit tests**

(1) A respirator which requires an effective seal with the face for proper functioning must not be issued to a worker unless a fit test demonstrates that the facepiece forms an effective seal with the wearer's face.

(2) Fit tests must be performed in accordance with procedures in *CSA Standard CAN/CSA-Z94.4-02, Selection, Use, and Care of Respirators*.

(2.1) A fit test must be carried out:

- (a) before initial use of a respirator,
- (b) at least once a year,

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- (c) whenever there is a change in respirator facepiece, including the brand, model, and size, and
- (d) whenever changes to the user's physical condition could affect the respirator fit.

(3) Other personal protective equipment that is to be worn at the same time as a respirator and which could interfere with the respirator fit must be worn during a fit test.

### **User seal check**

(1) Before each use of a respirator which requires an effective seal with the face for proper functioning, a worker must perform a positive or negative pressure user seal check in accordance with *CSA Standard CAN/CSA-Z94.4-02, Selection, Use, and Care of Respirators*.

(2) Subsection (1) does not apply to the emergency use of an escape respirator.

### **Medical assessment**

If a worker is required to use a respirator and there is doubt about the worker's ability to use a respirator for medical reasons, the worker must be examined by a physician, and the examining physician must be provided with sufficient information to allow the physician to advise the employer of the ability of the worker to wear a respirator.

### **Records**

The employer must maintain a record of (SHAPE also maintains a database):

- (a) fit test results and worker instruction,
- (b) maintenance for air supplying respirators, powered air purifying respirators, and for sorbent cartridges and canisters, and
- (c) maintenance and repairs for each self-contained breathing apparatus and all air cylinders in accordance with the requirements of *CSA Standard CAN/CSA-Z94.4-02, Selection, Use, and Care of Respirators*.

### **Maintenance and inspections**

(1) Inspection of compressed air cylinders must be done in accordance with *CSA Standard CAN/CSA-Z94.4-02, Selection, Use, and Care of Respirators*.

(2) Self-contained breathing apparatus, including regulators, must be serviced and repaired by qualified persons.

(3) Compressed air cylinders must be hydrostatically tested in accordance with CSA



*Standard CAN/CSA-B339-96, Cylinders, Spheres, and Tubes for the Transportation of Dangerous Goods.*

**Workplace monitoring**

- (1) If a worker is or may be exposed to a hazardous substance, the employer must ensure that:
  - (a) a walkthrough survey is conducted to assess the potential for overexposure taking into account all routes of exposure, including inhalation, ingestion, and skin contact, and
  - (b) reassessment is conducted when there is a change in work conditions which may increase the exposure, such as a change in production rate, process or equipment.
- (2) If the walkthrough survey required by subsection (1) reveals that a worker may be at risk of overexposure to an airborne contaminant, the employer must ensure that air sampling is conducted to assess the potential for overexposure.
- (3) Additional workplace monitoring to reliably determine worker exposure is required if:
  - (a) the assessment under subsection (2) reveals that a worker may be exposed to an air contaminant in excess of 50% of its exposure limit, or
  - (b) measurement is not possible at 50% of the applicable exposure limit.
- (4) Workplace exposure monitoring and assessment must be conducted using occupational hygiene methods acceptable to the Board.
- (5) The results of workplace exposure monitoring and assessment, or a summary of the results, must be provided to workers at their request without undue delay.

**Investigation**

- (1) The employer must ensure that the indoor air quality is investigated when:
  - (a) complaints are reported,
  - (b) occupancy in the space changes substantially, or
  - (c) renovations involving significant changes to the ventilation system occur.
- (2) An air quality investigation must include:
  - (a) assessment of the ventilation rate, unless the indoor carbon dioxide level is less than 650 ppm above ambient outdoor levels,
  - (b) inspection of the ventilation system as required in section 4.78(2),
  - (c) sampling for airborne contaminants suspected to be present in concentrations associated with the reported complaints, and
  - (d) a record of the complaint, the findings of the investigation, and any actions taken.

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*Also see SHAPE Safety Bulletin #10 - Artificially Created Smokes, Fogs and Lighting Effects*

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