

# **YUKON OCCUPATIONAL HEALTH REGULATIONS**

## **Section 1.**

1. (1) These regulations may be cited as the Occupational Health Regulations.  
(2) In these regulations, where a unit of measurement is given in metric (System International d'Unites - SI) the metric unit is binding and if an Imperial unit appears in parentheses after it the Imperial unit is given only as an approximate equivalent for the assistance of the reader.

## **Section 2. ILLUMINATION**

2. (1) Proper illumination shall be provided and maintained in accordance with these regulations in every area of a workplace used by employees or other people.  
(2) A safety officer may set in writing a standard in respect to the level and quality of illumination, including emergency lighting, standby lighting, and exterior lighting, in any workplace.  
(3) All lighting systems shall be designed to allow for light depreciation in service in order that the lighting level shall not diminish in service below the acceptable minimums required in these regulations.  
(4) The lighting source shall be shielded to control discomfort glare and the transverse shielding angle shall be not less than 12 degrees; the lighting source shall supply an upward component of not less than 10 per cent, or auxiliary units shall be provided that will direct a comparable amount of light upward, unless a Chief Industrial Safety Officer or Chief Mines Safety Officer directs otherwise.  
(5) The Chief Industrial Safety Officer or the Chief Mines Safety Officer may formulate rules in cases where formulas have not been provided by this regulation or where special circumstances render desirable an alteration to or modifications of the regulations.  
(6) Every employer shall maintain in good working order and in a clean condition any lighting fixture, and a safety officer may direct an employer or owner to clean, repair, relamp, or otherwise maintain any lighting fixture at any time.  
(7) The equipment, machines, or work space allotted to the worker shall be so placed that the worker will not have to face windows or other sources of light of high brightness in close proximity; where windows are a source of glare they shall be adequately shaded or shielded to protect workers' vision.  
(8) So far as reasonably practicable, arrangements shall be made by suitable screening or placing or other effective method, to prevent discomfort or injury by the reflection of light from shiny or mirror-like surfaces into the eyes of the workers.  
(9) Adequate measures shall be taken, so far as reasonably practicable, to prevent the formation of shadows which cause eye fatigue or risk of accident to any worker.  
(10) The minimum level of illumination to be maintained in service in workplaces shall not be less than the values stated in Table 1 below, unless a safety officer directs otherwise:

**Table 1. Seeing Tasks**

**Lux (Footcandles) in Service  
On Task or 30" Above Floor**

(a) Finest precision work	2,153 – 10,764 lx. (200 – 1000 footcandles)
Covering: Finest Detail Poor Contrasts, Long periods of time, i.e. Extra fine assembly, precision grading, Extra fine finishing and inspection.	
(b) Precision work	1076 lx. (100 footcandles)
Covering: Fine detail, Fair contrast, Lengthy period of time, i.e. Fine assembly, high-speed work, Fine finishing and inspection.	
(c) Accurate seeing tasks – continuous	538 lx. (50 footcandles)
Covering: Fine detail. Moderate contrasts, Lengthy periods of time, i.e. Ordinary bench work and assembly, Machine shop work, Medium finishing of parts, Garment mfg., laundry – spotting & repairs Food processing, Inspection areas, Printing, Laboratories	
(d) Ordinary seeing tasks	323 lx. (30 footcandles)
Covering: Moderately fine detail, Normal contrasts, Intermittent periods of time, i.e. Automatic machine operation areas, Rough grinding, garage work areas, Continuous processes, packing & shipping areas,	

Steel fabrication, welding,  
Lunchrooms,  
Washrooms,  
Foundries,  
Sawmills - shingle mills - plywood plants.

- (e) Casual seeing tasks 108 lx.  
(10 footcandles)
- i.e. Restrooms,  
Stairways, active storage.  
(Active storage buildings exempt from provision of shielding)
- (f) Simple seeing tasks (exempt from provision of shielding) 54 lx.  
(5 footcandles)
- i.e. Hallways, Passageways, Inactive Storage.

### Section 3.

3. (1) The brightness ratios in working areas shall not exceed those stipulated in Table 2, unless a safety officer directs otherwise:

**Table 2. Brightness Ratios**

- 5 to 1 between tasks and adjacent surroundings.
- 20 to 1 between tasks and more remote surfaces.
- 40 to 1 between luminaries (or sky) and surfaces adjacent to them.
- 80 to 1 anywhere within the environment of the worker.

- (2) Reflectance values in industrial working areas shall conform to Table 3 below unless a safety officer directs otherwise.

**Table 3. Reflectance Values**

<b>Surface</b>	<b>Reflection Factor (%)</b>	
	<b>Not Less Than</b>	<b>Not More Than</b>
Ceiling	50	90
Walls	40	60
Surface at task level	25	45
Machine and equipment	25	45
Floors	10	20

- (3) The minimum level of illumination to be maintained in service in offices and

shops shall not be less than the values stated in Table 4 below, unless a Safety Officer directs otherwise:

**Table 4. Seeing Tasks**

	<b>Lux (Footcandles) in Service On Task or 30" Above Floor</b>
Very difficult	2153 lx. (200 footcandles)
i.e. Cartography, designing, drafting, plan reading, timetables	
Difficult	1076 lx. (100 footcandles)
i.e. Regular office work involving operation of business machines, stenography, accounting, typing, active filing, clerking, billing, continuous reading and writing tasks. Store checkout counters.	
Ordinary	323 lx. (30 footcandles)
i.e. Conference and interviewing rooms, washrooms, inactive filing, switchboard and reception, desk areas with no office work involved, shop retail sales areas.	
Casual seeing tasks	215 lx. (20 footcandles)
i.e. Restrooms, corridors, stairways.	

(4) The brightness ratios in working areas of offices shall not exceed those stipulated in Table 5 below, unless a Safety Officer directs otherwise:

**Table 5. Brightness Ratios**

- 3 to 1 between tasks and adjacent surroundings.
- 10 to 1 between tasks and darker surfaces.
- 20 to 1 between luminaires (or windows) and surfaces adjacent to
- 40 to 1 anywhere within the environment of the worker

(5) Reflectance values in working areas of offices shall conform to Table 6 below, unless a Safety Officer directs otherwise:

**Table 6. Reflectance Values**

<b>Surface</b>	<b>Reflection Factor (%)</b>	
	<b>Not Less Than</b>	<b>Not More Than</b>
Ceiling finishes	70	90
Walls	40	60
Furniture	25	45
Office machines and equipment	25	45
Floors	15	30

**Section 4. NOISE CONTROL**

4. (1) When a worker's exposure to steady state noise or impact noise or both exceeds the permissible noise exposure levels the employer shall institute engineering controls to reduce the noise levels to or below the permissible values.
- (2) All persons exposed to excessive noise levels shall be provided with and shall wear a hearing protection device.
- (3) A worker's exposure to steady state and impact noise shall be limited to the following permissible values:

**Steady State Noise**

<b>Noise Level (dBA)</b>	<b>Maximum Daily Exposure Time Without Hearing Protection (Hours)</b>
85	8
88	4
91	2
94	1
97	1/2
100	1/4
over 103	0

**Impact Noise**

<b>Peak Sound Pressure Level (dB)</b>	<b>Maximum Number of Impacts per 24-Hour Period</b>
118	14400
121	7200
124	3600

127	1800
130	900
133	450
136	225
139	112
140	90
over 140	0

**Section 5.**

5. (1) Where muff type hearing protectors are worn, the worker shall be responsible for wearing hair and personal apparel in such a manner that the muff maintains an effective seal around the ears.
- (2) Workers in any work area shall not wear muff type hearing protectors or headsets which have been designed or modified to accept AM or FM radio or other music sources.
- (3) Subsection (2) does not apply to muff type hearing protectors designed and used for the express purpose of two-way radio or speech communication.
- (4) Every employer shall post and maintain clearly worded warning signs at entrances to, or on the periphery of, areas where persons are exposed to noise levels in excess of the limits specified in these regulations; these signs shall clearly state that a noise hazard exists and shall describe the protective equipment required.

**Section 6.**

6. (1) In any place of employment at which workers are exposed to noise in excess of the criteria stated in these regulations, the employer shall be responsible for the establishment and maintenance of an audiometric test program for those workers routinely exposed to noise levels in excess of the following:
  - (a) 80 dBA steady state noise for 8 hours, or
  - (b) impact noise of:

Peak Sound Pressure Level (dB)	Maximum Number of Impacts per 24-Hour Period
over 135	0
135	90
134	112
131	225
128	450
125	900

122	1800
119	3600
116	7200
113	14400

- (2) The audiometric testing program shall include the following requirements:
- (a) every worker exposed to noise levels in excess of those listed in subsection (1) shall receive an annual audiometric examination;
  - (b) each new worker who will be exposed to noise in excess of levels listed in clause (1) shall receive an audiometric examination within 6 months of the commencement of employment;
  - (c) a worker shall receive additional periodic follow-up examinations in any of the following circumstances:
    - (i) where a worker has been exposed to an unusually loud noise, such as an explosion;
    - (ii) where an ear infection, head injury, or complaint related to the ear has occurred;
    - (iii) where an audiogram has been classified as "abnormal change".
- (3) Each hearing test shall be administered by a physician, an audiologist or a certified audiometric technician.
- (4) Audiometric tests shall be conducted within a facility where the octave band sound pressure levels do not exceed those specified in the following table:

Octave-Band Centre Frequency	Octave-Band Sound Pressure Level (Decibels)
500	30
1000	30
2000	35
4000	42
8000	45

- (5) Each initial hearing test shall include a personal medical history of the worker; such medical history records shall not be duplicated or copies kept by the employer and shall be maintained confidentially by the Director.
- (6) Every employer conducting an audiometric testing program shall maintain a record of the audiometric test in respect of each worker, and shall keep a record of the test, for so long as the worker remains employed by that employer.
- (7) The authorized tester shall record the hearing tests in a manner set by the Director and submit the test results to the Director; other persons may receive a copy of the test results with the permission of the worker.
- (i) where in the opinion of the person conducting the hearing surveillance program the hearing of a worker has been impaired by excessive exposure to sound;
  - (ii) where audiometric examination of a worker discloses a hearing level in either ear averaging 25 decibels or more at 1,000, 2,000, 3,000 and 4,000 Hertz on a baseline audiogram;

(iii) where audiometric examination of a worker discloses a threshold shift from the baseline audiogram of 15 decibels or more in either ear at any audiometric test frequency from 1,000 Hertz to 6,000 Hertz inclusive; the person conducting the audiometric testing program shall within 30 calendar days refer the worker to a supervising physician or to an audiologist engaged by the employer to conduct diagnostic tests and to review the worker's health history and the assessment of the worker's exposure to sound.

## **Section 7. VENTILATION**

7. (1) Ventilation systems for the control of health hazards shall be designed, constructed and installed in accordance with established engineering principles as published by the American Conference of Governmental Industrial Hygienists, "Industrial Ventilation: A Manual of Recommended Practice".
- (2) All ventilation systems shall be maintained in good working order.
- (3) An employer may submit to the Director, drawings and specifications of the ventilation system or of any modifications to the ventilation system.

## **Section 8.**

8. (1) Airborne contaminants shall be controlled at their source by use of an effective local exhaust system; or where this is not practical, general ventilation systems, or a combination of the two shall be used.
- (2) Local exhaust ventilation systems shall be designed so that under normal work procedures a worker is not located between the source of contamination and the exhaust intake.
- (3) Where an exhaust system is installed, provision shall be made for an adequate supply of tempered make-up air. The opening of windows and doors is not adequate for this purpose.
- (4) Ventilation systems shall be designed so that contaminated exhaust air is not recirculated to the work area or other work sites.
- (5) Material or equipment, which will effect the efficiency of the ventilation system, shall not be piled or stored in front of ventilation openings.
- (6) Wherever an operation or work process produces combustible or flammable dusts, vapours, smoke, fumes, or gases in concentrations that may exceed the lower explosive limit of that substance, such operation or work process shall be provided with an appropriate separate exhaust ventilation system.
- (7) When there is a change in a work process, operation, machinery or equipment the ventilation system shall be modified as required to maintain the concentration of airborne contaminants below the levels prescribed in Tables 8 to 13 below.

## **Section 9. THERMAL ENVIRONMENT**



9. (1) Every employer shall provide and maintain in every indoor place of employment thermal conditions, including air temperature, radiant temperature, humidity and air movement, which are reasonable and appropriate to the nature of the work performed.
- (2) At every indoor place of employment where the thermal environment is likely to be of discomfort or danger to the workers, the employer shall provide an appropriate and suitably located instrument for measuring the thermal conditions.
- (3) Where it is not reasonably practicable to control thermal conditions pursuant to subsection (1) or where the work is being performed outdoors, the employer shall provide effective protection for the health and safety and reasonable thermal comfort of workers; such protection may include:
- (a) frequent monitoring of thermal conditions;
  - (b) special or temporary equipment such as screens, shelters and temporary heating or cooling equipment;
  - (c) special clothing or personal protective equipment;
  - (d) hot or cold drinks, acclimatization or other physiological procedures;
  - (e) limited work schedules with rest and recovery periods, changes in workloads, changes in hours or other arrangements for work;
  - (f) any other appropriate measure.

#### **Section 10. SPACE ALLOTMENT**

10. (1) Every employer shall ensure that no part of the place of employment is overcrowded to a degree that may cause risk of injury to workers.
- (2) Without limiting the generality of subsection (1), the employer shall ensure that there is at least 10 cubic meters (353 cubic feet) of space for each worker employed at any one time in any workroom.
- (3) For the purpose of subsection (2), no space that is more than three meters (10 feet) from the floor and no space occupied by solid objects is to be taken into account.

#### **Section 11.**

11. (1) Where workers have in the course of their work reasonable opportunities for sitting without detriment to their work, the employer shall provide and maintain for their use appropriate seating to enable them to sit.
- (2) Where a substantial portion of any work can properly be done sitting, the employer shall provide and maintain:
- (a) a seat suitably designed, constructed, dimensioned and supported for the worker to do the work; and
  - (b) where needed, a footrest which can readily and comfortably support the feet.

#### **Section 12. HEAT STRESS**

12. (1) Where hot environment work conditions may cause heat disorders in workers employed in such conditions, the employer shall determine and record the thermal index using:

(a) Wet Bulb Globe Temperature (WBGT) according to the formulae:

INDOOR OR OUTDOOR WITHOUT SOLAR LOAD:

$$WBGT = 0.7WB + 0.3GT$$

OUTDOOR WITH SOLAR LOAD:

$$WBGT = 0.7WB + 0.2GT + 0.1DB$$

WHERE:

WB = natural wet-bulb temperature

DB = dry-bulb temperature

GT = globe thermometer temperature, or

(b) Wet Globe Temperature (WGT).

(2) Workers shall not be permitted to work continuously when the thermal index, as measured in clause (1), exceeds the following limits:

WORK ACTIVITY	Thermal index averaged over a 2 hour period			
	Low Air Velocity (less than 300 fpm or 91 m/min)		High Air Velocity (above 300 rpm or 91 m/min)	
	WBGT 30°C(86°F)	WGT 26°C(79°F)	WBGT 32°C(90°F)	WGT 28°C(82°F)
<b>Light Work</b> Sitting at ease: light hand work (writing, typing, drafting, bookkeeping); hand and arm (small bench tools, assembly, sorting) arm and leg work (operating foot switch or pedal, driving a car). Standing: drill press for small parts; milling machine for small parts; light power tools; casual walking.	28°C (82°F)	24°C (75°F)	31°C (87°F)	27°C (81°F)
<b>Moderate Work</b> (81°F) Hand and arm work (nailing, filing); arm and leg work (tractors, construction equipment); air hammer; heavy assembly; picking fruits and vegetables.	26°C (79°F)	22°C (72°F)	29°C (84°F)	25°C (77°F)
<b>Heavy Work</b> (77°F)				

Shovelling, sledge hammer work;  
sawing, planing; digging; axe work;  
pushing or pulling heavy loads;  
concrete block laying.

- (3) Where the thermal index exceeds the levels in clause (2), the employer shall
  - (a) implement engineering methods to reduce the thermal index or isolate the worker from the source of heat, or
  - (b) implement work-rest regimes so that the thermal index averaged over the hottest 2 hour period is below that listed in clause (2),
  - (c) ensure that the worker is wearing appropriate protective clothing, or
  - (d) implement a combination of (a), (b) and (c).
- (4) Where workers are exposed to hot work conditions, the employer shall:
  - (a) instruct the workers in the recognition of symptoms of heat disorders including heat exhaustion, dehydration, heat cramps, prickly-heat, and heat stroke, and
  - (b) provide an adequate supply of potable water and salt supplement or a 0.1-0.2% saline drinking solution.

### **Section 13. HAZARDOUS SUBSTANCES**

13. (1) Hazardous chemical substances include the following substances:
  - (a) explosives;
  - (b) compressed gases;
  - (c) flammable liquids;
  - (d) flammable solids;
  - (e) corrosive substances;
  - (f) poisonous and infectious substances;
  - (g) oxidizers and organic peroxides;
  - (h) radioactives; and
  - (i) hot liquids.
- (2) The storage and handling of hazardous chemical substances shall be so controlled as to prevent spillage or accidental lighting of these substances; the following measures shall be taken:
  - (a) separating or isolating any chemical substance which when mixed with other substances, may cause a fire or an explosion or may liberate flammable or poisonous gases;
  - (b) keeping containers, piping, and other apparatus in good working order; and
  - (c) not leaving any spilled substance on the floors or shelves.

### **Section 14.**

14. (1) Flammable gases such as ammonia, hydrogen, acetylene, and hydrogen sulfide, shall never be stored with oxidizing substances or with gases maintaining

combustion such as chlorine, nitrogen tetroxide, oxygen, and compressed air.

- (2) Compressed gas cylinders shall
  - (a) be in accordance with the regulations of the Canadian Transport Commission,
  - (b) be labelled and homologated,
  - (c) be away from any radiator or other heat sources,
  - (d) not be exposed to temperature above 50°C (122°F),
  - (e) be provided with protective caps covering the valves, when not in use,
  - (f) be used only for the purposes they were designed,
  - (g) not be handled in a manner that could damage them and be fastened upright or held in a cart when being utilized, and
  - (h) be stored upright, with the valves on top, and firmly held in place.

### **Section 15.**

15. The storage, handling and use of flammable and combustible liquids, shall be carried out in accordance with the standard Flammable and Combustible Liquids Code NFPA 30-1969.

### **Section 16.**

16. (1) Corrosive substances shall be stored
  - (a) away from areas with high fire hazards,
  - (b) away from oxidizing substances,
  - (c) protected against direct solar rays, and
  - (d) in cool and well ventilated areas.
- (2) Containers for corrosive substances shall be
  - (a) kept closed,
  - (b) clearly identified,
  - (c) handled with care.
- (3) Workers engaged in the handling and decanting of corrosive substances shall wear individual protective equipment as required by the General Safety Regulations.
- (4) If the operations mentioned in subsection (3) are regularly or frequently performed, emergency showers and eye fountains shall be installed in the immediate surroundings.
- (5) Open reservoirs and vats in which corrosive liquids are agitated with compressed air or heated with steam shall be so protected that the operator is not exposed to splashes.
- (6) Level indicators on open reservoirs and vats for corrosive liquids shall be provided with protective screens.
- (7) Reservoirs and tanks containing corrosive liquids shall be provided with an overflow device.

## **Section 17. POISONOUS SUBSTANCES**

17. (1) Poisonous substances shall be stored
  - (a) away from areas of high fire hazard and from heat sources,
  - (b) away from oxidizing substances, and
  - (c) in cool and well ventilated areas.
- (2) The cylinders for poisonous gases shall be clearly identified.
- (3) Signs specifying the nature of the danger shall be placed at all entrances to areas containing poisonous gases.
- (4) When poisonous substances that can be absorbed through the skin in harmful quantities are used or handled in open containers
  - (a) the workers shall wear personal protective equipment,
  - (b) means shall be provided to wash quickly a substance spilled on the skin.
- (5) The workers exposed to poisonous substances shall be advised of the hazards involved and of the protective methods to be used.
- (6) Level indicators for open reservoirs and vats containing poisonous liquids shall be provided with protective screens.
- (7) Reservoirs and tanks containing poisonous liquids shall be provided with an overflow device.

## **Section 18.**

18. (1) Flammable substances shall be stored
  - (a) away from areas with high fire hazards, and
  - (b) away from oxidizing substances.
- (2) Spontaneously combustible substances shall be kept
  - (a) in an inert liquid,
  - (b) in an inert atmosphere, or
  - (c) in airtight containers.
- (3) Substances that react with water shall be stored
  - (a) in closed containers,
  - (b) away from moisture sources, and
  - (c) away from sweating or dripping pipes.
- (4) Unstable substances subject to detonation by heat, shock, vibration or sound waves shall be stored separately and well protected.

## **Section 19. OXIDIZING SUBSTANCES**

19. (1) Oxidizing substances shall be stored
  - (a) away from acids and corrosive liquids with which they may react in an explosive manner,
  - (b) away from metallic powders,
  - (c) away from organic substances, and
  - (d) away from substances which oxidize easily, including wood surfaces.
- (2) Containers of oxidizing substances shall be

- (a) kept closed,
  - (b) clearly identified, and
  - (c) stored in cool, dry places.
- (3) Any equipment utilized for the process or handling of oxidizing materials shall be grounded.
- (4) Clothes contaminated by oxidizing substances shall be removed immediately and washed before being worn again.

### **Section 20.**

20. (1) All open containers in which non-corrosive liquids have a temperature exceeding 60°C (140°F) are agitated or heated, shall have their control devices isolated or guarded by a screen to protect the operator against splashes.
- (2) Level indicators on reservoirs, vats or other containers of hot liquids shall be provided with protective screens.
- (3) Workers engaged in the handling of hot liquids shall wear personal protective equipment.

### **Section 21. MEDICAL EXAMINATIONS**

21. (1) For the purpose of these regulations  
"biological monitoring" means the recording of a series of medical tests or examinations which indicate the progressing health status of an individual or group of individuals;
- "certificate of medical fitness" means a document that indicates:
- (a) the date of the medical examination;
  - (b) the worker's name, occupation and department or work place;
  - (c) that the worker is medically
    - (i) fit,
    - (ii) fit with limitation (limitation to be stated),
    - (iii) unfit temporarily,
    - (iv) unfit permanently;
  - (d) the signature of the qualified medical practitioner.

### **Section 22.**

22. (1) The employer shall ensure that workers are medically examined whenever
- (a) there is exposure to the dust or fume of lead or its compounds at or above 50% of those limits listed in Table 8; or
  - (b) there is exposure to mercury or its compounds at or above 50% of those limits listed in Table 8,
  - (c) there is exposure to dust containing 1% or more by weight free silica at or above 50% of those limits listed in Table 10; or
  - (d) there is exposure to dust containing asbestos, which when airborne, results

in asbestos fibre levels at or above 50% of those limits listed in Table 10,  
(e) there is or there is likely to be any exposure to atmospheric pressures exceeding the ambient atmospheric pressure by 6.9kPa (1 psi),  
(f) any other harmful condition may exist which, in the opinion of the Director, requires medical examinations or medical investigations for workers so exposed.

### **Section 23.**

23. (1) All medical examinations and medical investigations shall be carried out in compliance with the requirements of these regulations and any other requirements the Director may set.
- (2) The medical practitioner is responsible for advising examined workers as to the nature of the occupational health hazards for which the examination is being carried out and as to the health precautions required.
- (3) After each examination required under this section
- (a) the medical practitioner shall forward to the employer a written certificate of the worker's medical fitness for employment in
    - (i) the worker's present or intended occupation, and
    - (ii) the worker's present or intended location, and
  - (b) each worker examined shall receive without undue delay an oral or written statement of medical fitness as determined by the examination and any biological monitoring tests.

### **Section 24.**

24. Whenever a medical examination reveals that a worker is likely to be peculiarly susceptible to an industrial disease or that a worker has already developed the early signs or symptoms of an industrial disease, then the medical practitioner shall undertake such other medical investigations as may be necessary and shall advise the worker and employer of preventive or remedial actions necessary in the circumstances.

### **Section 25.**

25. No employer shall knowingly employ any worker in any occupation or location when a medical practitioner has advised against such employment.

### **Section 26.**

26. (1) An individual worker's medical record shall be maintained on a confidential basis under the custody and control of the medical practitioner and shall not be

made available to either an employer or any person other than the Director without the consent of the worker.

(2) Whenever biological monitoring requires a chemical analysis of body fluids, the analysis shall be carried out by a laboratory acceptable to the Director.

### Section 27. AIR CONTAMINANTS

27. (1) A worker's exposure to airborne contaminants shall be limited to the stated permissible concentrations as specified in the tables and the preambles thereto.  
(2) When there is exposure to a mixture of two or more substances listed in the air contaminant tables, the effects of such exposure shall be considered to be additive, unless it is known otherwise, and the equivalent exposure as computed below shall not exceed unity (1):

$$E = \frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n}$$

where

E = equivalent exposure to the mixture

C<sub>1</sub> = measured time weighted average concentration of first substance etc,

C<sub>2</sub> = measured time weighted average concentration of second substance etc,

L<sub>1</sub> = the 8-hour time weighted average for first substance

L<sub>2</sub> = the 8-hour time weighted average for second substance, etc.

(3) Substances listed in Table 12 shall not exceed concentrations reducing the available oxygen below 18 per cent by volume in the work place atmosphere or which will present other hazards, such as fire and explosion.

(4) A worker's exposure to substances listed in Table 7 and Table 14 for periods of time greater than 8 hours in any 24-hour period shall be limited to the modified permissible concentration (M.P.C.) calculated as:

$$\text{M.P.C.} = \text{Permissible Concentration} \times \frac{8}{h} \times \frac{24-h}{16}$$

where Permissible Concentration are the values listed in Appendix A and B

h = number of hours of exposure on shift.

(5) When a worker's exposure to air contaminants exceeds permissible concentrations, the employer shall take immediate steps to reduce the worker's exposure to levels at or below the permissible concentration through engineering or administration controls.

(6) When engineering or administrative controls are not practicable the employer shall provide and the worker shall use personal protective equipment acceptable to the Chief industrial Safety Officer or the Chief Mines Safety Officer as a temporary means to control a worker's exposure to air contaminants, and the employer shall establish and maintain a health surveillance program to ensure that an exposed worker's body burden of harmful substances listed in Table 13 remains below the



maximum acceptable levels.

(7) Clauses (1) and (2) do not apply

(a) when air contaminant is present in a location or at a time at which human access is impossible, or unnecessary, or not permitted, or

(b) in temporary or emergency situations or during cleaning and disposal operations, provided that workers involved have been properly trained and protective equipment worn.

### **Section 28.**

28. Where it is necessary for an employer to reduce or contain the level of contamination at any place of employment, preference must be given to methods that do not involve pollution of the environment.

### **Section 29. INORGANIC LEAD**

29. (1) The employer shall ensure that each worker who is exposed to the dust or fume of inorganic lead or its compounds at or above 50% of those limits listed in Table 8 is medically examined.
- (2) A worker shall be medically examined within 15 days of the commencement of employment or exposure.
- (3) Additional periodic medical examinations shall be carried out at intervals prescribed by a qualified medical practitioner but in no case shall the interval exceed 5 years.
- (4) Biological monitoring shall include a urinary lead and blood lead analysis which shall be carried out at each medical examination and in accordance with Schedules 1 and 2.

### **Schedule 1. LEAD IN URINE**

(corrected to a Specific Gravity of 1.024)  
(Exposure to Inorganic Lead)

#### **Lead in Urine (micrograms/litre)**

Less than 150

150 - 200

More than 200

#### **Action Necessary**

Recheck within 3 months

Recheck within 6 weeks

(a) Recheck within one month

(b) Blood lead analysis within 15 days and refer to Schedule 2.

## Schedule 2. LEAD IN BLOOD

(Exposure to Inorganic Lead)

<b>Lead in Blood (micrograms/100 millilitres)</b>	<b>Action Necessary</b>
Less than 70	Recheck within one year
70 - 80	(a) Advise worker of potential danger and corrective measures. (b) Recheck blood lead within 3 months
More than 80	(a) Immediately reduce lead exposure (b) Medical interview and recheck blood lead within one month (c) If symptoms of lead poisoning are absent, consideration of removal of worker from further exposure to lead. (d) If symptoms of lead poisoning are present, worker shall not be further exposed to lead until sign and symptom free and blood lead is less than 70 micrograms per 100 milliliters of blood.

## Section 30. ORGANIC LEAD

30. (1) The employer shall ensure that each worker who is exposed to organic lead compounds at or above 50% of those limits listed in Table 8 is medically examined.  
(2) A worker shall be medically examined within 15 days of the commencement of employment or exposure.  
(3) Additional periodic medical examinations shall be carried out at intervals prescribed by a qualified medical practitioner but in no case shall the interval exceed 6 months.  
(4) Biological monitoring shall include a urinary lead analysis which shall be carried out at each medical examination and in accordance with Schedule 3.

## Schedule 3. LEAD IN URINE

(corrected to a Specific Gravity of 1.024)  
(Exposure to Organic Lead)

<b>Lead in Urine (micrograms/litre)</b>	<b>Action Necessary</b>
Less than 140	Recheck within one month
140 - 160	Reduce exposure and recheck within one week

- More than 160
- (a) Remove from further exposure
  - (b) Recheck result within one week
  - (c) Medical examination within one week
  - (d) Consideration of return to work.

**Section 31. MERCURY (EXCEPT FOR ALKYL MERCURY COMPOUNDS)**

31. (1) The employer shall ensure that each worker who is exposed to mercury or its compounds, other than the alkyl compounds, at or above 50% of those limits listed in Table 8 is medically examined.
- (2) A worker shall be medically examined within 15 days of commencement of employment or exposure.
- (3) Additional periodic medical examinations shall be carried out at intervals prescribed by a qualified medical practitioner, but in no case shall the interval exceed 2 years.
- (4) Biological monitoring shall include a urinary mercury analysis which shall be carried out at each medical examination and in accordance with Schedule 4.

**Schedule 4. MERCURY IN URINE**

(corrected to a Specific Gravity of 1.024)  
 (Except for exposure to Alkyl Mercury Compounds)

<b>Mercury in Urine (micrograms/litre)</b>	<b>Action Necessary</b>
Less than 250	Recheck within 3 months
250 - 500	Recheck within one month and if confirmed reduce further mercury exposure until urinary mercury level is less than 250 micrograms per litre
More than 500	<ul style="list-style-type: none"> <li>(a) Immediately reduce mercury exposure</li> <li>(b) Medical interview and recheck urinary mercury within one month</li> <li>(c) If symptoms of mercury poisoning are absent, consideration of removal of worker from further exposure</li> <li>(d) If symptoms of mercury poisoning are present, worker shall not be further exposed to mercury until sign and symptom free and urinary mercury is less than 200 micrograms per litre.</li> </ul>

## Section 32. ALKYL MERCURY COMPOUNDS

32. (1) The employer shall ensure that each worker who is exposed to alkyl mercury compounds at or above 50% of those limits listed in Table 8 is medically examined.
- (2) A worker shall be medically examined within 15 days of the commencement of employment or exposure.
- (3) Additional periodic medical examinations shall be carried out at intervals prescribed by a qualified medical practitioner but in no case shall the interval exceed one year.
- (4) Biological monitoring shall include a urinary mercury analysis which shall be carried out at each medical examination and in accordance with Schedule 5.

### Schedule 5. MERCURY IN URINE

(corrected to a Specific Gravity of 1.024)  
(Exposure to Alkyl Mercury Compounds)

<b>Mercury in Urine (micrograms/litre)</b>	<b>Action Necessary</b>
--	-------------------------

Less than 40

Recheck within one month

More than 40

(a) Immediately reduce mercury exposure

(b) Medical interview and recheck within 15 days

(c) If symptoms of mercury poisoning are absent, consideration of removal of worker from further exposure

(d) If symptoms of mercury poisoning are present, worker shall not be further, exposed to mercury until sign and symptom free and urine mercury is less than 20 micrograms per litre

## Section 33. ASBESTOS CONTROL

33. In this regulation

"asbestos" means chrysotile, crocidolite, amosite, tremolite, anthophyllite and actinolite when in their fibrous form;

"asbestos control contractor" means an employer certified by an accredited agency as competent in asbestos control;

"FEV" means forced expiratory volume in 1.0 second;

"FVC" means forced vital capacity;

"pulmonary function technician" means a person who has passed a pulmonary function technician course approved by the Director, or has been approved by the Director as having the equivalent of an approved pulmonary function technician course and has passed a requalification examination when requested by the Director;

"HEPA filter" means high efficiency particulate air filter;  
"restricted area" means an area of a work site in which there is a reasonable potential for worker exposure to airborne asbestos in an amount equal to or greater than 25% of the 8-hour Occupational Exposure Limit, in Table 10.

### **Section 34. General Provisions for Asbestos Control**

34. (1) A pre-project meeting shall be held between the contractor, the on-site supervisor and an Occupational Health and Safety Officer prior to any work commencing on any asbestos control project.
- (2) Approval for deviation from these regulations may be granted by the Chief Safety Officer prior to the work commencing, provided an acceptable alternate level of protection is provided to the workers.
- (3) A competent worker, certified in asbestos control procedures, must remain on-site at all times during the work process.
- (4) An asbestos control contractor shall ensure:
- (a) The work area is sealed off from all other areas in the building by use of heavy duty polyethylene or similar impermeable material;
  - (b) All openings such as doors, windows, and air vents are sealed with polyethylene, taped securely in place;
  - (c) All entrances and exits to the restricted area are controlled by triple panel polyethylene air locks;
  - (d) A ventilation unit capable of maintaining a 10% negative air pressure must be installed in the work area with HEPA filters on the exhaust side which is outside the work area.
- (5) When unprotected workers are required to be in an area adjacent to a restricted area, continuous instantaneous air sampling shall be conducted in the adjacent area by the asbestos control contractor.
- (6) When all the asbestos has been removed from the site, the asbestos control contractor shall conduct air sampling to ensure a concentration of less than 0.2 fibres per cc has been obtained.
- (7) The asbestos control contractor may remove the polyethylene enclosure after a concentration lower than 0.2 fibres per cc has been obtained.
- (8) As a final clean-up, an asbestos control contractor shall clean all exposed surfaces in the work area by vacuuming, utilizing a vacuum cleaner with a 2-stage HEPA filter.
- (9) Prior to the work area being returned to regular use, an Occupational Health and Safety Officer shall conduct air sampling to ensure the level of asbestos contamination is below the acceptable level (less than 0.2 fibres per cc)
- (10) The asbestos control contractor shall transport all bagged materials to a prearranged sanitary landfill site and ensure it is covered over immediately.

### **Section 35. Procedures Within Restricted Area**

35. (1) The employer shall

- (a) use water containing a wetting agent to soak the asbestos surface;
  - (b) remove the soaked asbestos by scraping with hard tools or similar means;
  - (c) ensure that removal is complete and no asbestos material remains on the surface or on beams, pipes or similar surfaces;
  - (d) keep the work site clear of unnecessary accumulations of asbestos waste;
  - (e) wet the asbestos for handling where practicable;
  - (f) ensure that any cleaning of a restricted area is done by wet sweeping or by use of a vacuum cleaner equipped with a HEPA filter;
  - (g) ensure that all asbestos waste is kept, conveyed and disposed of in sealed containers that are impervious to asbestos and are clearly labelled to indicate the contents and carcinogenic hazard, with a warning that the dust should not be breathed.
- (2) Where conditions render it impossible to achieve complete removal, a sealant must be applied by an asbestos control contractor to fix the asbestos to the surface.
- (3) An employer shall ensure all tools and equipment are thoroughly washed or vacuumed prior to being removed from the restricted area.

### **Section 36. Restricted Area**

36. An employer shall:
- (1) Limit access to the restricted area to persons authorized by law or the employer;
  - (2) Ensure no person shall eat, drink or smoke in a restricted area;
  - (3) Ensure that any person entering the restricted area is attired with protective clothing and equipment;
  - (4) Post signs at the entrance to, or on the perimeter of a restricted area, indicating that:
    - (a) asbestos is present;
    - (b) access is limited to authorized personnel;
    - (c) asbestos is a carcinogen; and
    - (d) eating, drinking, and smoking are prohibited.
  - (5) Ensure that any person leaving a restricted area is free from asbestos contamination.

### **Section 37. Direction to Workers**

37. An employer shall, prior to commencing a project, provide direction and instruction to all workers involved in the project outlining
- (a) the health hazards associated with exposure to asbestos fibres and the additional risk when combined with cigarette smoking;
  - (b) the requirement to wear the personal protective equipment as outlined by these regulations;
  - (c) the use and limitations of the respiratory protection being provided; and
  - (d) the work to be performed at the site.

### **Section 38. Protection of Workers**

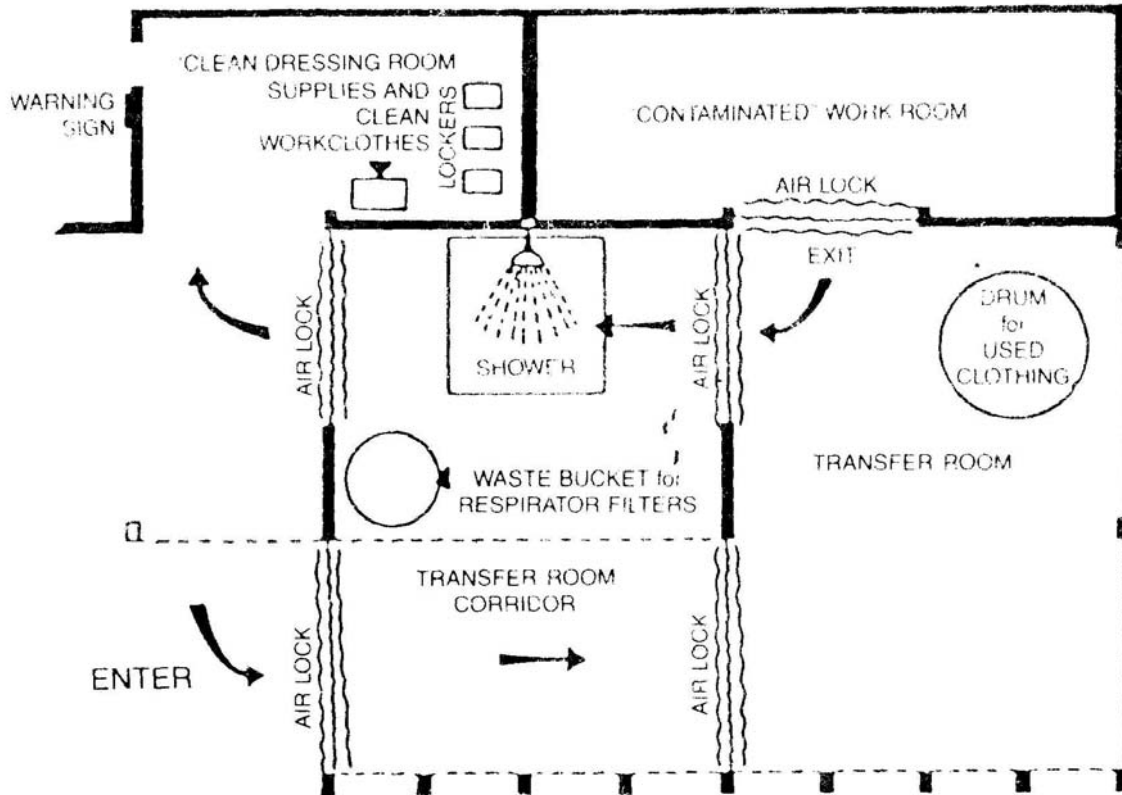
38. An employer shall provide:
- (a) a complete change of clothing, including coveralls, caps and rubber boots, for each worker involved in work with asbestos;
  - (b) respiratory protection designed to protect against exposure to asbestos fibre;
  - (c) sanitary facilities within or close to the restricted area;
  - (d) a shower facility to remove all asbestos fibres from the body; and
  - (e) goggles, hard hats or other Personal Protective Equipment as required by the General Safety Regulations for the work being performed.

### **Section 39. Personal Decontamination**

39. (1) An employer shall provide at least three separate decontamination chambers for workers to use to ensure that they and their clothing are free of asbestos contamination when they leave the work site.
- (2) An employer shall construct the decontamination chambers, except for the shower, of sufficient size to hold all the workers, their protective clothing and equipment, and their street clothing.
- (3) Every worker shall remove, and store or dispose, all clothing and protective equipment except the respirator while in the first chamber, or transfer room.
- (4) Every worker shall enter the shower with the respiratory equipment still in place.
- (5) After each worker has thoroughly washed their head, face and respirator, they may remove their respirators and discard the used filters.
- (6) In the third chamber, or clean room, workers shall dress in street clothing and store their respirators with new filters installed.
- (7) The employer shall provide facilities within the clean room to store street clothing and to ensure no contamination of street clothing occurs.
- (8) The employer shall ensure:
- (a) reusable protective clothing worn in a restricted area is laundered when necessary and in any event not less frequently than every 3 days of use;
  - (b) protective clothing to be laundered is transported from a restricted area in sealed containers that are clearly labelled to indicate the contents and carcinogenic hazard with a warning that dust should not be breathed; and
  - (c) used disposable protective clothing and discarded filters are treated as asbestos waste.
- (9) An employer shall construct doors between chambers of triple sheets of polyethylene, opening on alternating sides to ensure as good a seal as reasonably practical between chambers.

## DIAGRAM 1

Floor Plan For A Typical  
Asbestos Removal Or  
Encapsulation Work Site



### Section 40. Medical Examinations

40. For the purposes of this section "exposed worker" means a worker who, for at least 10 days in a 12-month period, will likely be exposed to airborne asbestos in an amount equal to or greater than 25% of the 8-hour Occupational Exposure Limited in Table 10.

### Section 41.

41. (1) The employer of an exposed worker shall ensure that the worker undergoes a medical assessment within 30 days after the first exposure, and
- (a) not later than every 24 months after the date of the assessment, for the first ten 12-month periods if the worker continues to be an exposed worker for those



- periods,  
(b) not later than every 12 months after the date of the last assessment conducted under clause (a), for as long as the worker continues to be an exposed worker.
- (2) For the purpose of determining whether a worker is an exposed worker under subsection 41(1) the first 12-month period commences on the date of the worker's first exposure to airborne asbestos.
- (3) A medical assessment shall consist of
- (a) a P.A. chest x-ray on a 35 cm by 43 cm (14" x 17") plate,
  - (b) a pulmonary function test, including the spirogram, FEV<sub>1</sub> and FVC, all conducted by a pulmonary function technician,
  - (c) an assessment of the worker's ability to wear a respiratory protective device, and
  - (d) a written history specifying the worker's
    - (i) occupational exposure to industrial dust and carcinogens,
    - (ii) respiratory symptoms including dyspnoea, cough, sputum production, wheezing or chest tightness,
    - (iii) incidence of asthma, chronic bronchitis, emphysema, lung cancer, or other chronic lung disease, and
    - (iv) smoking history.
- (4) An asbestos control contractor shall bear the cost of providing medical assessments under these regulations.

#### **Section 42. SILICA**

42. (1) The employer shall ensure that each worker who is exposed to dust containing 1% or more by weight free silica at or above 50% of those limits listed in Table 10 is medically examined.
- (2) A worker shall be medically examined within 30 days of the commencement of employment or exposure.
- (3) Additional periodic medical examination shall be carried out at intervals prescribed by a qualified medical practitioner but in no case shall the interval exceed 3 years.
- (4) Biological monitoring shall include
- (a) the measurement of Forced Expiratory Volume in one second and the Forced Vital Capacity, and
  - (b) a chest x-ray on a film approximately 35 x 43 cm (14" x 17"). These tests shall be carried out at each medical examination and at any other time as determined by a qualified medical practitioner; the chest x-ray films shall be interpreted by a physician competent to do so.

#### **Section 43. RADON GAS**

43. In this regulation

"radon daughters" means the short-lived radioactive decay products of radon-222, polonium-218, lead-214, and polonium-214.

"working level" or "WL" means the amount of any combination of radon daughters in one litre of air that releases  $1.3 \times 10^5$  mega electron volts of alpha energy during decay to lead-210.

#### **Section 44.**

44. The employer shall ensure that airborne concentrations of radon, where workers are exposed, are reduced to levels as low as reasonably practicable.

#### **Section 45.**

45. When the working level exceeds one, corrective action shall be taken forthwith.

#### **Section 46.**

46. (1) A plan for regular radiation monitoring of work areas shall be submitted to the Chief Mines Safety Officer prior to commencement of operations.  
(2) All radiation measurements shall be made by utilizing a method approved by the Chief Mines Safety Officer.  
(3) A record of all radiation measurements shall be forwarded to the Chief Mines Safety Officer once per month.  
(4) A copy of the information forwarded to the Chief Mines Safety Officer shall be posted at the workplace at a location convenient to all workers.

**TABLE 7**

#### **Maximum Acceptable Body Burden**

	<b>Maximum Concentration</b>	
	<b>Blood</b>	<b>Urine</b>
	<b>Ug/100mL</b>	<b>ug/L</b>
Arsenic	50	1500
Cadmium	10	35
Lead		
Inorganic	80	200
Alkyl compounds	-	160
Manganese	-	75
Mercury		
Inorganic	-	500
Alkyl compounds	-	40

Vanadium	-	150
Selenium	-	300
Fluoride	-	5000
Carbon Monoxide	10%	as carboxyhaemoglobin

**TABLE 8**  
**Permissible Concentrations for**  
**Airborne Contaminant Substances**

ppm – parts of vapour or gas per million parts of contaminated air by volume at 25°C and 760 mm mercury pressure.

mg/m<sup>3</sup> = approximate milligrams of material per cubic meter of air.

	<b>Permissible Concentrations</b>			
	<b>8-hour Limit</b>		<b>15-minute Limit</b>	
	<b>ppm</b>	<b>mg/m<sup>3</sup></b>	<b>ppm</b>	<b>mg/m<sup>3</sup></b>
Abate		10	-	20
Acetaldehyde	100	180	150	270
Acetic Acid	10	25	25	43
C Acetic anhydride	5	20	-	-
Acetone	1,000	2,400	1,250	3,000
Acetonitrile	40	70	60	105
Acetylene		(See Table 7)		
Acetylene dichloride, see 1,2-Dichloroethylene	200	790	250	1,000
Acetylene tetrabromide	1	14	1.25	18
Acrolein	0.1	0.25	0.3	0.8
Acrylamide - Skin	-	0.3	-	0.6
K Acrylonitrile - Skin		(See Table 14)		
Aldrin - Skin	-	0.25	-	0.75
Aliphatic solvent "140 Flash"	25	150	37	225
Allyl alcohol - Skin	2	5	4	10
Allyl chloride	1	3	2	6
Allyl glycidyl ether (AGE) - Skin	5	22	10	44
Allyl propyl disulphide	2	12	3	18
Alundum (Al <sub>2</sub> O <sub>3</sub> )		(See Table 11)		
K 4-Aminodiphenyl - Skin		(See Table 15)		

2-Aminoethanol, see Ethanolamine	3	6	6	12
2-Aminopyridine	0.5	2	1.5	6
Ammonia	25	18	40	30
Ammonium chloride - fume	-	10	-	20
Ammonium sulphamate (Ammate)	-	10	-	20
n-Amyl acetate	100	525	150	780
sec-Amyl acetate	125	650	150	810
Aniline (o-, p-isomers) - Skin	5	19	5	19
Anisidine (o-, p-isomers) - Skin	0.1	0.5	0.1	0.5
Antimony and compounds (as Sb)	-	0.5	-	0.75
K Antimony trioxide production (as Sb)		(See Table 14)		
ANTU (a-Naphthyl thiourea)	-	0.3	-	0.9
Argon		(See Table 12)		
Arsenic and compounds (as As)	-	0.5	-	0.5
K Arsenic trioxide production (as As)		(See Table 14)		
Arsine	0.05	0.2	0.05	0.2
K Asbestos (all forms)		(See Table 10)		
Asphalt (petroleum) fumes	-	5	-	10
Atrazine	-	10	-	15
Azinphos-methyl - Skin	-	0.2	-	0.6
Barium (soluble compounds) (as Ba)	-	0.5	-	0.5
Baygon (Propoxur)	-	0.5	-	2
K Benzene		(See Table 14)		
K Benzidine production - Skin		(See Table 15)		
p-Benzoquinone, see Quinone	0.1	0.4	0.3	1.2
Benzoyl peroxide	-	5	-	5
K Benz(a)pyrene		(See Table 14)		
Benzyl chloride	1	5	1	5
K Beryllium		(See Table 14)		

Biphenyl	0.2	1	0.2	1
C Bisphenol A, see Diglycidyl ether (DGE)	0.05	2.8	-	-
Bismuth telluride	-	10	-	20
Bismuth telluride (Selenium-doped)	-	5	-	10
Boron oxide	-	10	-	20
Boron tribromide	1	10	3	30
C Boron trifluoride	1	3	-	-
Bromine	0.1	0.7	0.3	2
Bromine pentafluoride	0.1	0.7	0.3	2
Bromochloromethane/chloro bromomethane	200	1,050	250	1,300
Bromoform - Skin	0.5	5	0.5	5
Butadiene (1,3-butadiene)	1,000	2,200	1,250	2,750
Butane	600	1,400	750	1,600
Butanethiol, see Butyl mercaptan		(See Table 9)		
2-Butanone	200	590	250	740
2-Butoxyethanol (Butyl cellosolve) - Skin	50	240	150	720
n-Butyl acetate	150	710	200	950
sec-Butyl acetate	200	950	250	1,180
tert-Butyl acetate	200	950	250	1,180
Butyl acrylate	10	55	15	82
C n-Butyl alcohol - Skin	50	150	-	-
sec-Butyl alcohol	150	450	150	450
tert-Butyl alcohol	100	300	150	450
C Butylamine - Skin	5	15	-	-
C tert-Butyl chromate (as CrO <sub>3</sub> ) - Skin	-	0.1	-	-
n-Butyl glycidyl ether (BGE)	50	270	75	400
n-Butyl lactate	5	25	5	25
Butyl mercaptan		(See Table 9)		
p-tert Butyltoluene	10	60	20	120
Cadmium, dust and salts (as Cd)	-	0.05	-	0.15
C Cadmium oxide fume (as Cd)	-	0.05	-	-

K Cadmium oxide production (as Cd)		(See Table 14)		
Calcium carbonate/marble		(See Table 11)		
Calcium arsenate (as As)	-	1	-	3
Calcium cyanamide	-	0.5	-	1
Calcium hydroxide	-	5	-	10
Calcium oxide	-	2	-	4
Calcium silicate		(See Table 11)		
Camphor, synthetic	2	12	3	18
Caprolactam -				
Dust	-	1	-	3
Vapour	5	20	10	40
Captan	-	5	-	15
Carbaryl (Sevin <sup>R</sup> )	-	5	-	10
Carbofuran (Furadan <sup>R</sup> )	-	0.1	-	0.1
Carbon black	-	3.5	-	7
Carbon dioxide	5,000	9,000	15,000	27,000
Carbon disulphide - Skin	20	60	30	90
Carbon monoxide	50	55	400	440
Carbon tetrabromide	0.1	1.4	0.3	4
Carbon tetrachloride - Skin	10	65	20	130
C Carbonyl chloride (phosgene)	0.05	0.2	-	-
Carbonyl fluoride	5	15	10	30
Cellulose (paper fibre)		(See Table 11)		
Cesium hydroxide	-	2	-	2
Chlordane - Skin	-	0.5	-	1.5
Chlorinated camphene - Skin	-	0.5	-	1
Chlorinated diphenyl oxide	-	0.5	-	2
Chlorine	1	3	3	9
Chlorine dioxide	0.1	0.3	0.3	0.9
C Chlorine trifluoride	0.1	0.4	-	-
C Chloroacetaldehyde	1	3	-	-
a-Chloroacetophenone (Phenacyl chloride)	0.05	0.3	0.05	0.3
Chlorobenzene (Monochlorobenzene)	75	350	75	350

o-Chlorobenzylidene malonitrile - Skin	0.05	0.4	0.05	0.4
Chlorobromomethane/Bromochloromethane	200	1,050	250	1,300
2-Chloro-1,3-butadiene, see B-Chloroprene - Skin	25	90	35	125
Chlorodifluoromethane	1,000	3,500	1,250	4,375
Chlorodiphenyl (42% Chlorine) - Skin	-	1	-	2
Chlorodiphenyl (54% Chlorine) - Skin	-	0.5	-	1
1-Chloro,2,3-epoxy-propane (Epichlorohydrin) - Skin	5	20	10	40
2-Chloroethanol (Ethylene chlorohydrin) - Skin	1	3	1	3
K Chloroethylene (Vinyl chloride)		(See Table 14)		
K Chloroform (Trichloromethane)		(See Table 14)		
K bis-Chloromethyl ether		(See Table 14)		
1-Chloro-1-nitro-propane	20	100	20	100
Chloropicrin	0.1	0.7	0.1	0.7
B-Chloroprene - Skin	25	90	35	135
Chlorpyrifos (Dursban <sup>R</sup> ) - Skin	-	0.2	-	0.6
o-Chlorostyrene	50	285	75	420
o-Chlorotoluene - Skin	50	250	75	375
2-Chloro-6-(trichloromethyl pyridine N-serve <sup>R</sup> )	-	10	-	20
Chromic acid and chromates (as CrO <sub>3</sub> )	-	0.1	-	0.1
K Chromite ore processing (chromate) (as Cr)		(See Table 14)		
Chromium - Soluble chromic chromous salts (as Cr)	-	0.5	-	1.5
Metal and insoluble salts	-	0.1	-	3.0
Clopidol (Coyden <sup>R</sup> )	-	10	-	20
Coal dust		(See Table 10)		

K Coal tar pitch volatiles (see Particulate polycyclic aromatic hydrocarbons)		(See Table 14)		
Cobalt metal, dust and fume (as Co)	-	0.05	-	0.15
Copper - Fume	-	0.2	-	0.2
Dusts and mists (as Cu)	-	1	-	2
Corundum (Al <sub>2</sub> O <sub>3</sub> )		(See Table 11)		
Cotton dust raw	-	0.2	-	0.6
Crag <sup>R</sup> herbicide	-	10	-	20
Cresol, all isomers - Skin	5	22	5	22
Crotonaldehyde	2	6	6	18
Crufomate	-	5	-	20
Cumene - Skin	50	245	75	365
Cyanide (as CN) - Skin	-	5	-	5
Cyanogen	10	20	10	20
Cyclohexane	300	1,050	375	1,300
Cyclohexanol	50	200	50	200
Cyclohexanone	50	200	50	200
Cyclohexene	300	1,015	300	1,015
Cyclohexylamine - Skin	10	40	10	40
Cyclopentadiene	75	200	150	400
2,4-D (2,4-Diphenoxy-acetic acid)	-	10	-	20
DDT (Dichlorodiphenyl- trichloroethane)	-	1	-	3
DDVP, see Dichlorvos - Skin	0.1	1	0.3	3
Decaborane - Skin	0.05	0.3	0.15	0.9
Demeton <sup>R</sup> - Skin	0.01	0.1	0.03	0.3
Diacetone alcohol (4-hydroxy-4-methyl-2- pentanone)	50	240	75	360
1,2-Diaminoethane, see Ethylenediamine	10	25	10	25
Diazinon - Skin	-	0.01	-	0.03
Diazomethane	0.2	0.4	0.2	0.4
Diborane	0.1	0.1	0.1	0.1
K 1,2-Dibromoethane (Ethylene dibromide) - Skin		(See Table 14)		



Dibrom <sup>R</sup>	-	3	-	6
2-N-Dibutylaminoethanol - Skin	2	14	4	28
Dibutyl phosphate	1	5	2	10
Dibutyl phthalate	-	5	-	10
C Dichloroacetylene	0.1	0.4	-	-
C o-Dichlorobenzene	50	300	-	-
	75	450	110	675
K 3,3-Dichlorobenzidine - Skin		(See Table 15)		
Dichlorodifluoromethane	1,000	4,950	1,250	6,200
1,3-Dichloro-5,5-dimethyl hydration	-	0.2	-	0.4
1,1-Dichloroethane	200	810	250	1,012
1,2-Dichloroethane	50	200	75	300
1,2-Dichloroethylene	200	790	250	1,000
Dichloroethyl ether - Skin	5	30	10	60
Dichloromethane, see Methylene chloride	200	720	200	720
Dichloromonofluoromethane	500	2,100	625	2,625
C 1,1-Dichloro-1-nitroethane	10	60	-	-
1,2-Dichloropropane, see Propylene dichloride	75	350	115	525
Dichlorotetrafluoroethane	1,000	7,000	1,250	8,750
Dichlorvos (DDVP) - Skin	0.1	1	0.3	3
Dicyclopentadiene	5	30	5	30
Dicyclopentadienyl iron	-	10	-	20
Dieldrin - Skin	-	0.25	-	0.75
Diethylamine	25	75	25	75
Diethylaminoethanol - Skin	10	50	10	50
Diethylene triamine - Skin	1	4	1	4
Diethyl ether, see Ethyl ether	400	1,200	500	1,500
Diethyl phthalate	-	5	-	10
Difluorodibromomethane	100	860	150	1,290
C Diglycidyl ether (DGE)	0.5	2.8	-	-
Dihydroxybenzene, see Hydroquinone	-	2	-	3
Diisobutyl ketone	25	150	25	150

Diisopropylamine - Skin	5	20	5	20
Dimethoxymethane, see Methylal	1,000	3,100	1,250	3,875
Dimethyl acetamide - Skin	10	35	15	50
K Dimethyl carbamyl chloride		(See Table 16)		
Dimethylamine	10	18	10	18
Dimethylaminobenzene, see Xylidene - Skin	5	25	10	50
Dimethylaniline (N,N-Dimethylaniline) - Skin	5	25	10	50
Dimethylbenzene, see Xylene - Skin	100	435	150	650
Dimethyl-1,2-dibromo-2-dichloroethyl phosphate, see Dibrom <sup>R</sup>	-	3	-	6
Dimethylformamide - Skin	10	30	20	60
2,6-Dimethyl-4-heptanone, see Diisobutyl ketone	25	150	25	150
1,1-Dimethylhydrazine - Skin	0.5	1	1	2
Dimethylphthalate	-	5	-	10
K Dimethyl sulphate - Skin		(See Table 14)		
Dinitrobenzene (all isomers) - Skin	0.15	1	0.5	3
Dinitro-o-cresol - Skin	-	0.2	-	0.6
3,5-Dinitro-o-toluamide (Zoalene <sup>R</sup> )	-	5	-	10
Dinitrotoluene - Skin	-	1.5	-	5
Dioxane, tech. grade - Skin	50	180	50	180
Diphenyl, see Biphenyl	0.2	1	0.6	3
Diphenylamine	-	10	-	20
C Diphenylmethane diisocyanate, see Methylene bisphenyl isocyanate (MDI)	0.02	0.2	-	-
Dipropylene glycol methyl ether - Skin	100	600	150	900
Diquat (Reglone <sup>R</sup> )	-	0.5	-	1
Di-sec,octyl phthalate (Di-2-ethylhexylphthalate	-	5	-	10

Disulfiram	-	2	-	5
Disyston - Skin	-	0.1	-	0.3
2,6-Ditert,butyl-p-cresol	-	10	-	20
Dyfonate	-	0.1	-	0.1
Emery		(See Table 11)		
Endosulfan (ThiodanR) - Skin	-	0.1	-	0.3
Endrin - Skin	-	0.1	-	0.3
K Epichlorohydrin - Skin		(See Table 14)		
EPN - Skin	-	0.5	-	2
1,2-Epoxypropane, see Propylene oxide	100	240	150	360
2,3-Epoxy-1-propanol, see Glycidol	50	150	75	225
Ethane		(See Table 12)		
Ethanethiol, see Ethyl mercaptan		(See Table 9)		
Ethanolamine	3	6	6	12
Ethion (Nialate <sup>R</sup> ) - Skin	-	0.4	-	0.4
2-Ethoxyethanol - Skin	100	370	150	560
2-Ethoxyethyl acetate (Cellosolve acetate) - Skin	100	540	150	810
Ethyl acetate	400	1,400	400	1,400
Ethyl acrylate - Skin	25	100	25	100
Ethyl alcohol (Ethanol)	1,000	1,900	1,000	1,900
Ethylamine	10	18	10	18
Ethyl sec-amyl ketone (4- Methyl-3-heptanone)	25	130	25	130
Ethyl benzene	100	435	125	545
Ethyl bromide	200	890	250	1,110
Ethylbutyl ketone (3-Heptanone)	50	230	75	345
Ethyl chloride	1,000	2,600	1,250	3,250
Ethyl ether	400	1,200	500	1,500
Ethyl formate	100	300	150	450
Ethyl mercaptan		(See Table 9)		
Ethyl silicate	100	850	150	1,275
Ethylene		(See Table 12)		
C Ethylene chlorohydrin - Skin	1	3	-	-
Ethylenediamine	10	25	10	25

Ethylene dibromide, see 1,2-Dibromoethane	20	145	30	220
Ethylene dichloride, see 1,2-Dichloroethane	50	200	75	300
Ethylene glycol -				
Particulate	-	10	10	20
Vapour	100	250	125	325
C Ethylene glycol dinitrate and/or Nitroglycerin - Skin	0.2	-	-	-
Ethylene glycol monomethyl ether acetate (Methyl cellosolve acetate) - Skin	25	120	35	150
Ethylene oxide	50	90	75	135
Ethylenimine - Skin	0.5	1	0.5	-
Ethylidene chloride, see 1,1-Dichloroethane	200	810	250	1,010
C Ethylidene norbornene	5	25	10	50
N-Ethylmorpholine - Skin	20	95	20	94
Fensulfothion (Dasanit <sup>R</sup> )	-	0.1	-	0.1
Ferbam	-	10	-	20
Ferrovandium dust	-	1	-	3
Fluoride (as F)	-	2.5	-	2.5
Fluorine	1	2	2	4
Fluorotrichloromethane	1,000	5,600	1,250	7,000
C Formaldehyde	2	3	-	-
Formamide	20	30	30	45
Formic acid	5	9	5	9
Furfural - Skin	5	20	15	60
Furfuryl alcohol - Skin	5	20	10	40
Gasoline		(See Table 9)		
Germanium tetrahydride	0.2	0.6	0.6	1.8
Glass, fibrous or dust		(See Table 11)		
Glutaraldehyde, activated or unactivated	-	0.25	-	-
Glycerin mist		(See Table 11)		
Glycidol (2,3-Epoxy-1-propanol)	50	150	65	190
Glycol monoethyl ether, see 2-Ethoxyethanol - Skin	100	370	150	560

Graphite (synthetic)		(See Table 11)		
Guthion <sup>R</sup> , see Azinphos- methyl - Skin	-	0.2	-	0.6
Gypsum		(See Table 11)		
Hafnium	-	0.5	-	1.5
Helium		(See Table 12)		
Heptachlor - Skin	-	0.5	-	1.5
Heptane (n-Heptane)	400	1,600	500	2,000
Hexachlorocyclopentadiene	0.01	0.11	0.03	0.33
Hexachloroethane - Skin	1	10	3	30
Hexachloronaphthalene - Skin	-	0.2	-	0.6
Hexafluoroacetone	0.1	0.7	0.3	2.1
Hexane (n-hexane)	100	360	125	450
K Hexamethyl phosphoramidate - Skin		(See Table 16)		
2-Hexanone, see Methyl butyl ketone - Skin	25	100	40	150
Hexone (Methyl isobutyl ketone) - Skin	100	410	125	510
sec-Hexyl acetate	50	300	50	300
K-Hydrazine - Skin		(See Table 16)		
Hydrogen		(See Table 12)		
Hydrogenated terphenyls	0.5	5	0.5	5
Hydrogen bromide	3	10	3	10
C Hydrogen chloride	5	7	-	-
Hydrogen cyanide - Skin	10	11	15	16
Hydrogen fluoride	3	2	3	2
Hydrogen peroxide	1	1.5	2	2.8
Hydrogen selenide	0.05	0.2	0.05	0.2
Hydrogen sulphide	10	15	15	27
Hydroquinone	-	2	-	3
Indene	10	45	15	70
Indium and compounds (as In)	-	0.1	-	0.3
C Iodine	0.7	1	1	1
Iodoform	0.2	3	0.4	6
Iron oxide fume (as Fe <sub>2</sub> O <sub>3</sub> )	-	5	-	10
Iron pentacarbonyl	0.01	0.08	0.01	0.08
Iron salts, soluble (as Fe)	-	1	-	2
Isoamyl acetate	100	525	125	655

Isoamyl alcohol	100	360	125	450
Isobutyl acetate	150	700	187	875
Isobutyl alcohol	50	150	75	225
C Isophorone	5	25	-	-
Isopropyl acetate	250	950	310	1,185
Isopropyl alcohol - Skin	400	980	500	1,225
Isopropylamine	5	12	10	24
Isopropyl ether	250	1,050	310	1,320
Isopropyl glycidyl ether (IGE)	50	240	75	360
Kaolin		(See Table 11)		
Ketene	0.5	0.9	1.5	2.7
Lead, inorganic, fumes and dusts (as Pb)	-	0.15	-	0.45
Lead arsenate (as Pb)	-	0.15	-	0.45
K Lead chromate (as Cr)		(See Table 14)		
Limestone		(See Table 11)		
Lindane - Skin	-	0.5	-	1.5
Lithium hydride	-	0.025	-	0.025
L.P.G. (Liquified petroleum gas)	1,000	1,800	1,250	2,250
Magnesite		(See Table 11)		
Magnesium oxide fume (as Mg)	-	10	-	10
Malathion - Skin	-	10	-	10
Maleic anhydride	0.25	1	0.25	1
C Manganese and compounds (as Mn)	-	5	-	-
Manganese cyclopentadienyl tricarbonyl (as Mn) - Skin	-	0.1	-	0.3
Marble/calcium carbonate		(See Table 11)		
Mercury (Alkyl compounds) - Skin (as Hg)	0.001	0.01	0.003	0.03
Mercury (all forms except Alkyl) (as Hg)	-	0.05	-	0.15
Mesityl oxide	25	100	25	100
Methane		(See Table 12)		
Methanethiol, see Methyl mercaptan		(See Table 9)		
Methoxychlor	-	10	-	10

2-Methoxyethanol - Skin (Methyl cellosolve)	25	80	35	120
Methyl acetate	200	610	250	760
Methyl acetylene (propyne)	1,000	1,650	1,250	2,050
Methyl acetylene- propadiene mixture (MAPP)	1,000	1,800	1,250	2,250
Methyl acrylate - Skin	10	35	10	35
Methylacrylonitrile - Skin	1	3	2	6
Methylal (dimethoxymethane)	1,000	3,100	1,250	3,875
Methyl alcohol (methanol) - Skin	200	260	250	310
Methylamine	10	12	10	12
Methyl amyl alcohol, see Methyl isobutyl carbinol - Skin	25	100	40	150
Methyl 2-cyanoacrylate	2	8	4	16
Methyl isoamyl ketone	100	465	150	710
Methyl n-amyl ketone (2- Heptanone)	100	465	150	710
Methyl bromide - Skin	15	60	15	60
Methyl butyl ketone, see 2- Hexanone - Skin	25	100	40	150
Methyl cellosolve - Skin, see 2-Methoxyethanol	25	80	35	120
Methyl cellosolve acetate - Skin, see Ethylene glycol monomethyl ether acetate	25	120	35	150
Methyl chloride	100	210	125	260
Methyl chloroform (1,1,1- Trichloroethane)	350	1,900	440	2,400
Methylcyclohexane	400	1,600	500	2,000
Methylcyclohexanol	50	235	75	350
o-Methylcyclohexanone - Skin	50	230	75	345
Methylcyclopentadienyl manganese tricarbonyl (as Mn) - Skin	0.1	0.2	0.3	0.6
Methyl demeton - Skin	-	0.5	-	1.5
C Methylene bisphenyl isocyanate (MDI)	0.02	0.2	-	-

Methylene chloride (dichloromethane)	200	700	250	870
K 4,4'-Methylene(bis(2- chloroaniline) - Skin		(See Table 14)		
C Methylene bis(4- cyclohexylisocyanate)	0.01	0.11	-	-
Methyl ethyl ketone (MEK), see 2-Butanone	200	590	250	740
C Methyl ethyl ketone peroxide	0.2	1.5	-	-
Methyl formate	100	250	150	375
Methyl iodide - Skin	5	28	10	56
Methyl isoamyl ketone	100	475	150	710
Methyl isobutyl carbinol - Skin	25	100	40	150
Methyl isobutyl ketone, see Hexone - Skin	100	410	125	510
Methyl isocyanate - Skin	0.02	0.05	0.02	0.05
Methyl mercaptan		(See Table 9)		
Methyl methacrylate	100	410	125	510
Methyl parathion - Skin	-	0.2	-	0.6
Methyl propyl ketone, see 2- Pentanone	200	700	250	875
N-Methyl-2-pyrrolidone	100	400	125	500
C Methyl silicate	5	30	-	-
C $\alpha$ -Methyl styrene	100	480	-	-
Mineral wool		(See Table 11)		
Molybdenum (as Mo)				
Soluble compounds	-	5	-	10
Insoluble compounds	-	10	-	20
Monomethyl aniline - Skin	2	9	4	18
Cc Monomethyl hydrazine - Skin	0.2	0.35	-	-
Morpholine - Skin	20	70	30	105
Naphtha (coal tar)	400	1,800	500	2,250
Naphthalene	10	50	15	75
K B-Naphthylamine		(See Table 16)		
$\alpha$ -Naphthylthiourea (ANTU)	-	0.3	-	0.9
Neon		(See Table 12)		
C Nickel carbonyl	0.05	0.35	-	-



Nickel metal and insoluble compounds (as Ni)	-	1	-	3
Nickel, soluble compounds (as Ni)	-	0.1		0.3
K Nickel sulphide roasting, fume and dust as (Ni)		(See Table 14)		
Nicotine - Skin	-	0.5	-	1.5
Nitric acid	2	5	4	10
Nitric oxide	25	30	35	45
p-Nitroaniline - Skin	1	6	2	12
Nitrobenzene - Skin	1	5	2	10
p-Nitrochlorobenzene - Skin	-	1	-	2
K 4-Nitrodiphenyl		(See Table 15)		
Nitroethane	100	310	150	465
Nitrogen		(See Table 12)		
C Nitrogen dioxide	5	9	-	-
Nitrogen trifluoride	10	29	15	45
Nitroglycerin - Skin	0.2	2	0.2	2
Nitromethane	100	250	150	375
1-Nitropropane	25	90	35	135
K 2-Nitropropane		(See Table 14)		
K N-Nitrosodimethylamine (dimethylnitrosoamine) - Skin		(See Table 16)		
Nitrotoluene - Skin	5	30	10	60
Nitrotrichloromethane, see Chloropicrin	0.1	0.7	0.1	0.7
Nonane	200	1,050	250	1,300
Octachloronaphthalene - Skin	-	0.1	-	0.3
Octane	300	1,450	375	1,800
Oil mist, mineral	-	5	-	10
Osmium tetroxide (as Os)	0.0002	0.002	0.0006	0.006
Oxalic acid	-	1	-	2
Oxygen difluoride	0.05	0.1	0.15	0.3
Ozone	0.1	0.2	0.3	0.6
Paraffin wax fume	-	2	-	6
Paraquat, respirable sizes	-	0.5	-	0.5
Parathion - Skin	-	0.1	-	0.3

K Particulate polycyclic aromatic hydrocarbons (PPAH) (as benzene solubles)		(See Table 14)		
Pentaborane	0.005	0.01	0.015	0.03
Pentachloronaphthalene	-	0.5	-	1.5
Pentachlorophenol - Skin	-	0.5	-	1.5
Pentaerythritol		(See Table 11)		
Pentane	600	1,800	750	2,250
2-Pentanone	200	700	250	875
Perchloroethylene - Skin	100	670	150	1,000
Perchloryl fluoride	3	14	6	28
Phenol - Skin	5	19	10	38
Phenothiazine - Skin	-	5	-	10
p-Phenylene diamine - Skin	-	0.1	-	0.1
Phenyl ether (vapour)	1	7	2	14
Phenyl ether-Diphenyl mixture (vapour)	1	7	2	14
Phenylethylene, see Styrene, monomer	100	420	125	525
Phenyl glycidyl ether (PGE) $\pm$	10	60	15	90
Phenyl mercaptan	3	10	3	10
Phenylhydrazine - Skin	5	22	10	44
C Phenylphosphine	0.05	0.25	-	-
Phorate (Thimet <sup>R</sup> ) - Skin	-	0.05	-	0.15
Phosdrin (Mevinphos <sup>R</sup> ) - Skin	0.01	0.1	0.03	0.3
Phosgene (carbonyl chloride)	0.1	0.4	0.3	1.2
Phosphine	0.3	0.4	1	1
Phosphoric acid	-	1	-	3
Phosphorus (yellow)	-	0.1	-	0.3
Phosphorus pentachloride	-	1	-	3
Phosphorus pentasulphide	-	1	-	3
Phosphorus trichloride	0.5	3	0.5	3
C Potassium hydroxide	-	2	-	-
Propane		(See Table 12)		
K B-Propiolactone		(See Table 16)		

Propargyl alcohol - skin	1	2	3	6
n-Propyl acetate	200	840	250	1,050
Propyl alcohol - Skin	200	500	250	625
n-Propyl nitrate	25	110	40	140
Propylene		(See Table 12)		
Propylene dichloride (1,2-Dichloropropane)	75	350	115	525
C Propylene glycol dinitrate - Skin	0.2	2	-	-
Propylene glycol monomethyl ether	100	360	150	450
Propylene imine - Skin	2	5	2	5
Propylene oxide	100	240	150	360
Propyne, see Methyl acetylene	1,000	1,650	1,250	2,050
Pyrethrum	-	5	-	10
Pyridine	5	15	10	30
Quinone	0.1	0.4	0.3	1
RDXR - Skin	-	1.5	-	3
Resorcinol	10	45	20	90
Rhodium				
Metal fume and dusts (as Rh)	-	0.1	-	0.3
Soluble salts (as Rh)	-	0.001	-	0.003
Ronnel	-	10	-	10
Rosin core solder pyrolysis products (as formaldehyde)	-	0.1	-	0.3
Rotenone (commercial)	-	5	-	10
Rouge		(See Table 11)		
Rubber solvent (Naphtha)	400	1,800	500	2,250
Selenium compounds (as Se)	-	0.2	-	0.2
Selenium hexafluoride (as Se)	0.05	0.4	0.05	0.4
SevinR, see Carbaryl	-	5	-	10
Silane, see Silicon tetrahydride	0.5	0.7	1	1.5
Silicon		(See Table 11)		
Silicon carbide		(See Table 11)		
Silicon tetrahydride (Silane)	0.5	0.7	1	1.5
Silver, metal and soluble compounds (as Ag)	-	0.01	-	0.03

C Sodium azide	0.1	0.3	-	-
Sodium fluoroacetate (1080) - Skin	-	0.05	-	0.15
C Sodium hydroxide	-	2	-	-
"60 Solvent"	100	450	125	560
"70 Solvent"	50	300	75	450
Starch		(See Table 11)		
Stibine	0.1	0.5	0.3	1.5
Stoddard solvent	100	575	150	720
Strychnine	-	0.15	-	0.45
C Succinaldehyde (Glutaraldehyde)	-	0.25	-	-
Styrene, monomer (Phenylethylene)	100	420	125	525
C Subtilisins (Proteolytic enzymes as 100% pure crystalline enzyme)	-	0.00006	-	-
Sucrose		(See Table 11)		
Sulphur dioxide	5	13	5	13
Sulphur hexafluoride	1,000	6,000	1,250	7,500
Sulphuric acid	-	1	-	1
Sulphur monochloride	1	6	3	18
Sulphur pentafluoride	0.025	0.25	0.075	0.75
Sulphur tetrafluoride	0.1	0.4	0.3	1
Sulphuryl fluoride	5	20	10	40
Systox, see Demeton <sup>R</sup> - Skin	0.01	0.1	0.03	0.3
2,4,5-T	-	10	-	20
Tantalum	-	5	-	10
TEDP - Skin	-	0.2	-	0.6
Teflon <sup>R</sup> decomposition products (as Fluorine)	-	2.5	-	5
Tellurium and compounds (as Te)	-	0.1	-	0.1
Tellurium hexafluoride (as Te)	0.02	-	0.02	-
TEPP - Skin	0.004	0.05	0.012	0.15
C Terphenyls	1	9	-	-
1,1,1,2-Tetrachloro-2,2- difluoroethane	500	4,170	625	5,210

1,1,2,2-Tetrachloro-1,2-difluoroethane	500	4,170	625	5,210
1,1,2,2-Tetrachloroethane - Skin	5	35	10	70
Tetrachloroethylene, see Perchloroethylene - Skin	100	670	150	1,000
Tetrachloromethane, see Carbon Tetrachloride - Skin	10	65	20	130
Phthalic anhydride	1	6	4	24
Picloram (Tordon <sup>R</sup> )	-	10	-	20
Picric acid - Skin	-	0.1	-	0.3
Pival <sup>R</sup> (2-Pivalyl-1,3-indandione)	-	0.1	-	0.3
Plaster of Paris		(See Table 11)		
Platinum (soluble salts) (as Pt)	-	0.002	-	0.002
Polychlorobiphenyls, see Chlorodiphenyls - Skin	-	-	-	-
Polytetrafluoroethylene decomposition products (as Fluorine)	2	2.5	-	5
Portland cement		(see Table 11)		
Tetrachloronaphthalene	-	2	-	4
Tetraethyl lead (as Pb) - Skin	-	0.1	-	0.3
Tetrahydrofuran	200	590	250	700
Tetramethyl lead (as Pb) - Skin	-	0.15	-	0.45
Tetramethyl succinonitrile - Skin	0.5	3	1.5	9
Tetranitromethane	1	8	1	8
Tetryl (2,4,6-trinitrophenylmethylnitramine) - Skin	-	1.5	-	3.0
Thallium, soluble compounds (as Tl) - Skin	-	0.1	-	0.1
4,4'-Thiobis(6-tert-butyl-m-cresol)	-	10	-	20
Thioglycolic acid	1	5	2	10
Thiram <sup>R</sup>	-	5	-	10

Tin, inorganic compounds, except SnH <sub>4</sub> and SnO <sub>3</sub> (as Sn)	-	2	-	4
Tin, organic compounds (as Sn) - Skin	-	0.1	-	0.2
Tin oxide (as Sn)		(See Table 11)		
Titanium dioxide (as Ti)		(See Table 11)		
Toluene (toluol) - Skin	100	375	150	560
C Toluene-2,4-diisocyanate (TDI)	0.02	0.14	-	-
o-Toluidine	5	22	10	44
Toxaphene, see Chlorinated camphene - Skin	-	0.5	-	1.5
Tributyl phosphate	-	5	-	5
C 1,2,4-Trichlorobenzene	5	40	-	-
1,1,1,-Trichloroethane, see Methyl chloroform	350	1,900	440	2,400
1,1,2-Trichloroethane - Skin	10	45	20	90
Trichloroethylene	100	535	150	800
K Trichloromethane, see Chloroform		(See Table 14)		
Trichloronaphthalene	-	5	-	10
1,2,3-Trichloropropane	50	300	75	450
1,1,2-Trichloro 1,2,2-trifluoroethane	1,000	7,600	1,250	9,500
Triethylamine	25	100	40	150
Tricyclohexyltin hydroxide (PlictranR)	-	5	-	10
Trifluoromonobromo-methane	1,000	6,100	1,200	7,625
Trimethyl benzene	25	120	35	180
Trimethyl phosphite	0.5	2.6	1.5	7.8
2,4,6-Trinitrophenol, see Picric acid - Skin	-	0.1	-	0.3
2,4,6-Trinitrophenyl-methylnitramine, see Tetryl - Skin	-	1.5	-	3
C 2,4,6-Trinitrotoluene (TNT)	-	0.5	-	-
Triorthocresyl phosphate	-	0.1	-	0.3
Triphenyl phosphate	-	3	-	6
Tungsten and compounds (as				

Soluble	-	1	-	3
Insoluble	-	5	-	10
Turpentine	100	560	150	840
Uranium (natural) soluble and insoluble compounds (as U)	-	0.2	-	0.6
Vanadium (V <sub>2</sub> O <sub>5</sub> ) (as V) - Dust	-	0.5	-	1.5
C Fume	-	0.05	-	-
Valeraldehyde	50	175	75	262
Vegetable oil mist		(See Table 11)		
Vinyl acetate	10	30	20	60
Vinyl benzene, see Styrene	100	420	125	525
Vinyl bromide	250	1,100	250	1,100
K Vinyl chloride		(See Table 14)		
Vinyl cyanide, see Acrylonitrile - Skin	20	45	30	70
Wood dust (nonallergenic)	-	5	-	10
Wood dust (allergenic)		(See Table 10)		
Vinyl toluene	100	480	150	720
Warfarin	-	0.1	-	0.3
Welding fumes	-	5.0	-	5
Xylene (o-, m-, p-isomers) - Skin	100	435	150	650
C m-Xylene a,a'-diamine	-	0.1	-	-
Xylidene - Skin	5	25	10	50
Yttrium	-	1	-	3
Zinc chloride fume	-	1	-	2
K Zinc chromate (as Cr)		(See Table 14)		
Zinc oxide fume	-	5	-	10
Zinc oxide dust		(See Table 11)		
Zinc stearate		(See Table 11)		
Zirconium compounds (as Zr)	-	5	-	10

**TABLE 9**

**Air Contaminants**

Substance	Permissible Concentrations			
	8 hour Limit		15-minute Limit	
	ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>

C Butyl mercaptan	3	9.3	-	-
C Ethyl mercaptan	3	7.6	-	-
C Methyl mercaptan	3	5.9	-	-
Wood dust, allergenic (e.g., cedar, mahogany, teak)	-	2.5	-	5
Gasoline <sup>2</sup>	500	625	-	-

	Permissible Concentrations	
	Impinger <sup>b</sup> (mppef)	Respirable Mass <sup>c</sup> (mg/m <sup>3</sup> )
Foundry dust:		
Silica sand	5	1.2 <sup>d</sup>
Olivine sand	5	3.3 <sup>d</sup>

**TABLE 10**  
**Mineral Dusts**

(Each substance must comply with at least one of the relevant requirements as determined by the air sampling technique used).

Substance	Permissible Concentrations	
	8 hour limit	(Fibres per mL) <sup>a</sup> 15 minute limit
Asbestos:		
Amosite	0.2	2
Chrysotile	0.5	5
Crocidolite	0.1	-
Tremolite	0.5	5
Talc (fibrous)	0.5	5

	Permissible Concentration (8-hr. Limit)		
	Column I	Column II	Column III
	KONIMETER <sup>b</sup> (Particles/mL)	IMPINGER <sup>c</sup> (mmppcf)	RESPIRABLE MASS <sup>d</sup> (mg/m <sup>3</sup> )
Silica:			
Quartz, crystalline	300	(e)	(g)
Cristobalite	150	(f)	(1/2 quartz value)
Tridymite	150	(f)	(1/2 quartz value)
Silica, fused or flour	300	(e)	(quartz value)
Tripoli	300	(e)	(quartz value)
Silica, amorphous	300	20	2
Diatomaceous earth	300	20	1.5



Silicates:			
Mica	-	20	-
Mineral wool fibre	-	-	10
Perlite	-	30	-
Portland Cement	-	30	-
Soapstone	-	20	-
Talc (nonasbestos form)	-	20	-
Graphite	-	20	-
Coal	-	-	2

**TABLE 11**  
**Nuisance Dust, Mists and Fumes**

(Each substance contained in this table must comply with at least one of the relevant requirements).

	PERMISSIBLE CONCENTRATIONS		
	8 hour Limit	15-minute Limit	
	Impinger* (mppcf)	Gravimetric mg/m <sup>3</sup>	Gravimetric (mg/m <sup>3</sup> )
Alundum (Al <sub>2</sub> O <sub>3</sub> )	30	10	20
Calcium carbonate	30	10	20
Calcium silicate	30	10	-
Cellulose (paper fibre)	30	10	20
Corundum (Al <sub>2</sub> O <sub>3</sub> )	30	10	-
Emery	30	10	20
Glass, fibrous or dust	30 <sub>b</sub>	10	-
Glycerine mist	30	10	-
Graphite (synthetic)	30	10	-
Gypsum	30	10	20
Kaolin	30	10	20
Limestone	30	10	20
Marble	30	10	20
Magnesite	30	10	20
Mineral wool fibre	30	10	-
Pentaerythritol	30	10	20
Plaster of Paris	30	10	20
Portland Cement	30	10	20
Rouge	30	10	20
Silicon	30	10	20
Silicon carbide	30	10	20

Starch	30	10	20
Sucrose	30	10	20
Tin oxide	30	10	20
Titanium dioxide	30	10	20
Zinc oxide dust	30	10	20
Vegetable oil mists (except castor, cashew nut, or similar irritating oils)	-	10	-
Zinc stearate	30	10	20

**TABLE 12**  
**ASPHYXIANT SUBSTANCES WHICH MUST BE**  
**CONTROLLED TO ENSURE THAT NO ATMOSPHERE IS**  
**OXYGEN DEFICIENT (LESS THAN 18% OXYGEN) AT**  
**ANY TIME**

Acetylene  
Argon  
Ethane  
Ethylene  
Helium  
Hydrogen  
Methane  
Neon  
Nitrogen  
Propane  
Propylene

**TABLE 13.**  
**MAXIMUM ACCEPTABLE BODY BURDENS**

Substance	Maximum Concentration	
	Blood ug/100ml	Urine ug/l*
Arsenic	50	1500
Cadmium	10	35
Lead inorganic	80	200
alkyl compounds	-	160

Manganese	-	75
Mercury inorganic	-	500
alkyl compounds	-	40
Vanadium	-	150
Selenium	-	300
Fluoride	-	5000**
<b>Carbon Monoxide</b>	10% as carboxyhaemoglobin	-

**TABLE 14**  
**Carcinogens with a Permitted Exposure**

Substance	Permissible Concentrations	
	8-hour Limit	
	ppm	mg/m <sup>3</sup>
Antimony trioxide production (as SB)	-	0.5
Arsenic trioxide production -		
As <sub>2</sub> O <sub>3</sub> (as As)	-	0.05
SO <sub>2</sub>	C5	-
Acrylonitrile	20	45
Benzene	C10	32
Beryllium	-	0.002
Cadmium oxide production (as Cd)	-	0.05
Chloroethylene (vinyl chloride)	1	2.5
Chloroform (trichloromethane)	10	50
bis-Chloromethyl ether	0.001	-
Chromite ore processing (chromate), as Cr	0.1	0.1
1,2-Dibromoethane	20	145
Dimethyl sulphate-Skin	1	5
Epichlorohydrin	5	20
Hydrazine	0.1	0.1
Lead chromate (as Cr)	-	0.05
4,4'-Methylene bis (2-chloroaniline) - Skin	0.02	0.02
Nickel sulfide roasting (fume and dust) as Ni	-	1
2-Nitropropane	25	-

**Carcinogens**

*A carcinogen is an agent which when absorbed into or onto the body may initiate uncontrolled cell growth. These substances listed in this Appendix are used in industry and have proven carcinogenic in man or have induced cancer in animals under appropriate experimental conditions.*

**TABLE 15**

### **Carcinogens With No Permitted Exposure**

No exposure or contact means isolating the process or operation by the best practical engineering methods. The worker should be equipped with personal protective equipment to ensure virtually no contact with the carcinogen.

4-Aminodiphenyl - Skin

3,3-Dichlorobenzidine - Skin

Benzidine production - Skin

4-Nitrodiphenyl

### **TABLE 16**

Carcinogens With No Established Permitted Concentration. Exposure to be carefully controlled and minimized.

Benzo(oo)pyrene

Dimethyl carbamyl chloride

Hexamethyl phosphoramidate - Skin

$\beta$ -Naphthylamine

$\beta$ -Propiolactone

N-Nitrosodimethylamine  
(dimethylnitrosoamine) - Skin