

Occupational Health and Safety Act

R.R.O. 1990, REGULATION 833

CONTROL OF EXPOSURE TO BIOLOGICAL OR CHEMICAL AGENTS

Consolidation Period: From July 1, 2016 to the [e-Laws currency date](#).

Last amendment: O. Reg. 347/15.

This is the English version of a bilingual regulation.

1. In this Regulation,

“ACGIH” means the American Conference of Governmental Industrial Hygienists; (“ACGIH”)

“ACGIH Table” means the table entitled “Adopted Values” shown at pages 10 to 61 of the publication entitled *2013 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices* published by ACGIH and identified by International Standard Book Number 978-1-607260-59-2; (“tableau de l’ACGIH”)

“C” or “ceiling limit” means the maximum airborne concentration of a biological or chemical agent to which a worker may be exposed at any time; (“C”, “valeur C”, “valeur plafond”)

“chemical agent” includes a chemical substance; (“agent chimique”)

“exposure” means exposure by inhalation, ingestion, skin absorption or skin contact; (“exposition”)

“Ontario Table” means Table 1 to this Regulation; (“tableau de l’Ontario”)

“STEL” or “short-term exposure limit” means the maximum airborne concentration of a biological or chemical agent to which a worker may be exposed in any 15-minute period; (“LECT”, “limite d’exposition à court terme”)

“TWA” or “time-weighted average limit” means the time-weighted average airborne concentration of a biological or chemical agent to which a worker may be exposed in a work day or work week. (“LMPT”, “limite moyenne pondérée dans le temps”) O. Reg. 491/09, s. 1; O. Reg. 149/12, s. 1; O. Reg. 274/14, s. 1.

2. (1) REVOKED: O. Reg. 347/15, s. 1.

(2) This Regulation does not apply,

(a) to a chemical agent listed in Table 1 of Ontario Regulation 490/09 (Designated Substances) made under the Act, in a workplace that is subject to that regulation with respect to that agent; or

(b) with respect to asbestos, in a workplace that is subject to Ontario Regulation 278/05 (Designated Substance — Asbestos on Construction Projects and in Buildings and Repair Operations) made under the Act. O. Reg. 491/09, s. 2.

2.1 Codes of practice relating to exposure of workers to biological or chemical agents that have been approved by the Minister for the purposes of subsection 32.2 (1) of the Act are available on the Ministry’s or the Government of Ontario’s website. O. Reg. 347/15, s. 2.

3. (1) Every employer shall take all measures reasonably necessary in the circumstances to protect workers from exposure to a hazardous biological or chemical agent because of the storage, handling, processing or use of such agent in the workplace. R.R.O. 1990, Reg. 833, s. 3 (1).

(2) The measures to be taken shall include the provision and use of,

(a) engineering controls;

(b) work practices;

(c) hygiene facilities and practices; and

(d) if section 7.2 applies, personal protective equipment. O. Reg. 491/09, s. 3.

4. Without limiting the generality of section 3, every employer shall take the measures required by that section to limit the exposure of workers to a hazardous biological or chemical agent in accordance with the following rules:

1. If the agent is listed in the Ontario Table, exposure shall not exceed the TWA, STEL, or C set out in the Ontario Table.

2. If the agent is not listed in the Ontario Table but is listed in the ACGIH Table, exposure shall not exceed the TWA, STEL, or C set out in the ACGIH Table.

3. If the Table that applies under paragraph 1 or 2 sets out a TWA for an agent but sets out neither a STEL nor a C for that agent, exposure shall not exceed the following excursion limits:

- i. Three times the TWA for any period of 30 minutes.
 - ii. Five times the TWA at any time.
4. Paragraph 3 does not apply with respect to an agent that is prescribed as a designated substance under Ontario Regulation 490/09 (Designated Substances) made under the Act. O. Reg. 491/09, s. 4.
5. In determining the exposure of workers to a hazardous biological or chemical agent under section 3 or 4, no regard shall be had to the wearing and use of personal protective equipment. R.R.O. 1990, Reg. 833, s. 5.
6. Airborne concentrations of hazardous biological or chemical agents and daily and weekly time-weighted average exposures shall be calculated in accordance with the rules set out in Schedule 1. O. Reg. 491/09, s. 5.
7. If the listing for an agent in the Ontario Table or in the ACGIH Table includes the notation “Skin” and the agent is present at the workplace, the employer shall take all measures reasonably necessary in the circumstances to protect workers from skin absorption of the agent. O. Reg. 491/09, s. 5.
- 7.1 If the listing for an agent in the ACGIH Table includes the reference “Simple asphyxiant” and the agent is present in the air at the workplace, the employer shall take all measures reasonably necessary in the circumstances to protect workers from,
- (a) exposure to an atmospheric oxygen level that is less than 19.5 per cent by volume; and
 - (b) related hazards such as fire and explosion. O. Reg. 491/09, s. 5.
- 7.2 (1) An employer shall protect workers from exposure to a hazardous biological or chemical agent without requiring them to wear and use personal protective equipment, unless subsection (2) applies or the employer complies with an applicable code of practice. O. Reg. 491/09, s. 5; O. Reg. 347/15, s. 3.
- (2) The employer shall provide, and workers shall wear and use, personal protective equipment appropriate in the circumstances to protect the workers from exposure to the agent, if engineering controls required by this Regulation,
- (a) are not in existence or are not obtainable;
 - (b) are not reasonable or not practical to adopt, install or provide because of the duration or frequency of the exposures or because of the nature of the process, operation or work;
 - (c) are rendered ineffective because of a temporary breakdown of the controls; or
 - (d) are ineffective to prevent, control or limit exposure because of an emergency. O. Reg. 491/09, s. 5.
8. (1) If a worker has been exposed to a hazardous biological or chemical agent and,
- (a) the worker or the worker’s physician has reason to believe that the worker’s health has been affected by exposure to the agent and the worker or the worker’s physician has so notified the employer in writing; or
 - (b) the employer has reason to believe that the worker’s health is likely to be affected by the exposure and the employer has so notified the worker in writing,
- the worker, if he or she agrees, shall undergo medical examinations and clinical tests, at the employer’s expense, to determine whether the worker has an occupational illness because of exposure to the agent and whether the worker is fit, fit with limitations or unfit to continue working in exposure to the agent. O. Reg. 491/09, s. 6.
- (2), (3) REVOKED: O. Reg. 491/09, s. 6.
- (4) The employer shall provide the physician who examines the worker or under whose supervision clinical tests are performed with a copy of the records, if any, of the exposure of the worker to the hazardous biological or chemical agent. R.R.O. 1990, Reg. 833, s. 8 (4).
9. REVOKED: O. Reg. 607/05, s. 3 (2).

TABLE 1
ONTARIO TABLE OF OCCUPATIONAL EXPOSURE LIMITS

Listing	French Listing Equivalent	Agent [CAS No.]	Time-Weighted Average Limit (TWA)	Short-Term Exposure Limit (STEL) or Ceiling Limit (C)	Notations
1.	4.	*Acrylonitrile [107-13-1]	2 ppm	C 10 ppm	Skin
2a.	50a.	Aliphatic hydrocarbon gases – Alkane [C ₁ -C ₄], except Butane, All isomers	1,000 ppm		
2b.	50b.	Aliphatic hydrocarbon gases – Butane, All isomers [106-97-8]; [75-28-5]	800 ppm		
3.	7.	*Arsenic, elemental arsenic and inorganic compounds [7440-38-2], and organic compounds (only where both inorganic and organic compounds are present), as As.	0.01 mg/m ³	0.05 mg/m ³	

4a.	5a.	*Asbestos – All forms [1332-21-4]	0.1 f/cc (F)		
4b.	5b.	*Asbestos – Actinolite [77536-66-4]	0.1 f/cc (F)		
4c.	5c.	*Asbestos – Amosite [12172-73-5]	0.1 f/cc (F)		
4d.	5d.	*Asbestos – Anthophyllite [77536-67-5]	0.1 f/cc (F)		
4e.	5e.	*Asbestos – Chrysotile [132207-32-0]	0.1 f/cc (F)		
4f.	5f.	*Asbestos – Crocidolite [12001-28-4]	0.1 f/cc (F)		
4g.	5g.	*Asbestos – Tremolite [77536-68-6]	0.1 f/cc (F)		
5.	10.	Benzaldehyde [100-52-7]		4 ppm, or 17 mg/m ³	
6.	11.	*Benzene [71-43-2]	0.5 ppm	2.5 ppm	Skin
7.	12.	Beryllium and compounds, as Be [7440-41-7]	0.002 mg/m ³	0.01 mg/m ³	
8.	19.	Calcium chloride [10043-52-4]	5 mg/m ³		
9.	15.	Carbon tetrachloride [56-23-5]	2 ppm	3 ppm	Skin
10.	16.	Charcoal, except activated [16291-96-6]	10 mg/m ³		
11.	66.	Chlorinated diphenyl oxides [55720-99-5]	0.5 mg/m ³	2 mg/m ³	
12.	17.	o-Chlorobenzaldehyde [89-98-5]		4 ppm, or 23 mg/m ³	
13a.	14a.	Chlorodiphenyl (42 per cent chlorine) [53469-21-9]	See listing for Polychlorinated Biphenyls (PCBs)		
13b.	14b.	Chlorodiphenyl (54 per cent chlorine) [11097-69-1]	See listing for Polychlorinated Biphenyls (PCBs)		
14.	22.	N-Cocomorpholine [1541-81-7]	5 ppm, or 52 mg/m ³		Skin
15.	46.	*Coke Oven Emissions ¹	0.15 mg/m ³		
16.	87.	Coumarone-Indene Resins (total dust) [63393-89-5]	5 mg/m ³		
17.	24.	Cymene (sum of o-, m- and p-isomers) [25155-15-1]	50 ppm, or 274 mg/m ³		Skin
18.	28.	1,1-Dichloroethene [75-35-4]	1 ppm, or 4 mg/m ³	20 ppm, or 80 mg/m ³	
19.	29.	1,3-Dichloro-2-Propanol [96-23-1]		1 ppm, or 5 mg/m ³	Skin
20.	40.	Diethylene glycol monoethyl ether [111- 90-0]	30 ppm, or 165 mg/m ³		
21.	74.	Di(2-ethylhexyl)phthalate (DEHP) [117-81-7]	3 mg/m ³	5 mg/m ³	
22.	73.	Diisodecyl phthalate [26761-40-0]	5 mg/m ³		
23.	30.	3-(Dimethylamino) propylamine [109-55-7]	0.5 ppm, or 2 mg/m ³		Skin
24.	31.	N, N-Dimethyl-cyclohexylamine [98-94-2]		5 ppm, or 26 mg/m ³	
25.	32.	N, N-Dimethyl-ethanolamine [108-01-0]	3 ppm, or 11 mg/m ³	6 ppm, or 22 mg/m ³	
26.	103.	Dimethyl terephthalate [120-61-6]	5 mg/m ³		
27.	18.	Dimethyl 2,3,5,6-tetrachloroterephthalate [1861-32-1]	5 mg/m ³		
28.	59.	Dipropylene glycol monomethyl ether acetate [88917-22-0]	100 ppm, or 776 mg/m ³	150 ppm, or 1,164 mg/m ³	
29.	34.	Diquat [2764-72-9; 85-00-7; 6385-62-2]	0.5 mg/m ³ , or 0.1 mg/m ³ (R)		Skin
30.	35.	Enflurane [13838-16-9]	2 ppm, or 16 mg/m ³		
31.	42.	Ethyl-3-ethoxy propionate[763-69-9]	50 ppm, or 300 mg/m ³		
32.	26.	Ethylene dibromide [106-93-4]	(L)		Skin
33.	39.	Ethylene glycol dimethyl ether [110-71-4]	5 ppm, or 18 mg/m ³		Skin
34.	41.	Ethylene glycol mono-n-propyl ether [2807-30-9]	25 ppm, or 110 mg/m ³		Skin
35.	63.	Ethylene glycol mononitrate[16051-48-2]	0.05 ppm, or 0.22 mg/m ³		Skin
36.	67.	*Ethylene oxide [75-21-8]	1 ppm, or	10 ppm, or	

			1.8 mg/m ³	18 mg/m ³	
37.	57.	Ethyl methacrylate [97-63-2]	50 ppm	100 ppm	
38.	79.	Flour dust	See listing for Wheat Flour Dust (total dust)		
39.	44.	Forane [26675-46-7]	2 ppm, or 15 mg/m ³		
40.	45.	Formaldehyde [50-00-0]		STEL 1 ppm, or C 1.5 ppm	
41.	47.	Halothane [151-67-7]	2 ppm, or 16 mg/m ³		
42.	1.	Heptyl acetate [112-06-1]	50 ppm, or 320 mg/m ³		
43.	48.	Hexamethylenetetramine (HMT) [100-97-0]		0.35 ppm, or 2 mg/m ³	
44.	49.	Hexamethyl phosphoramide [680-31-9]	(L)		Skin
45.	2.	Hexyl acetate (isomeric mixture) [88230-35-7]	50 ppm, or 294 mg/m ³		
46.	97.	Hydrogen sulfide [7783-06-4]	10 ppm	15 ppm	
47.	104.	Hydrogenated terphenyls ² [61788-32-7]	0.5 ppm		
48a.	52a.	*Isocyanates, organic compounds – Toluene diisocyanate (TDI) [584-84-9] [91-08-7]	0.005 ppm	C 0.02 ppm	
48b.	52b.	*Isocyanates, organic compounds – Methylene bisphenyl isocyanate (MDI) [101-68-8]	0.005 ppm	C 0.02 ppm	
48c.	52c.	*Isocyanates, organic compounds – Hexamethylene diisocyanate (HDI) [822-06-0]	0.005 ppm	C 0.02 ppm	
48d.	52d.	*Isocyanates, organic compounds – Isophorone diisocyanate (IPDI) [4098-71-9]	0.005 ppm	C 0.02 ppm	
48e.	52e.	*Isocyanates, organic compounds – Methylene bis (4-cyclohexylisocyanate) [5124-30-1]	0.005 ppm	C 0.02 ppm	
48f.	52f.	*Isocyanates, organic compounds – Methyl Isocyanate [624-83-9]	0.02 ppm		Skin
49.	53.	Isopropylaminoethanols [109-56-8] [121-93-7]		400 ppm, or 1,900 mg/m ³	
50.	33.	Isosorbide dinitrate [87-33-2]	0.2 mg/m ³		Skin
51a.	77a.	*Lead [7439-92-1], elemental lead, inorganic and organic compounds of lead, as Pb – except tetraethyl lead [78-00-2]	0.05 mg/m ³		Skin (organic compounds)
51b.	77b.	*Lead [7439-92-1] – Tetraethyl lead, as Pb [78-00-2]	0.10 mg/m ³	0.30 mg/m ³	
52a.	21a.	*Lead chromate [7758-97-6] – as Pb (see listing for lead) [7439-92-1]	0.05 mg/m ³		
52b.	21b.	*Lead chromate [7758-97-6] – as Cr	0.012 mg/m ³		
53.	54.	Lincomycin [154-21-2]	0.1 mg/m ³		
54a.	51a.	Lithium hydroxide – Anhydrous [1310-65-2]		1 mg/m ³	
54b.	51b.	Lithium hydroxide – Monohydrate [1310-66-3]		1 mg/m ³	
55.	55.	Manganese [7439-96-5]	0.2 mg/m ³		
56a.	56a.	*Mercury [7439-97-6], elemental mercury, inorganic and organic compounds of mercury, as Hg – All forms of except alkyl, as Hg	0.025 mg/m ³		Skin
56b.	56b.	*Mercury [7439-97-6] – Alkyl compounds of, as Hg	0.01 mg/m ³	0.03 mg/m ³	Skin
57.	58.	Methoxyflurane [76-38-0]	2 ppm, or 13 mg/m ³		
58.	60.	Methyl n-amyl ketone [110-43-0]	25 ppm, or 115 mg/m ³		
59.	38.	Methyl tert-butyl ether (MTBE) [1634-04-4]	40 ppm		
60.	61.	Methyl n-butyl ketone [591-78-6]	1 ppm, or 4 mg/m ³		Skin
61.	27.	4,4'-Methylene bis(2-chloroaniline) (MBOCA; MOCA®) [101-14-4]	0.0005 ppm, or 0.005 mg/m ³		Skin
62.	25.	4,4'-Methylene dianiline [101-77-9]	0.04 mg/m ³		Skin
63.	62.	N-Methyl-2-pyrrolidone [872-50-4]	400 mg/m ³		

64.	36.	Mineral Spirits	525 mg/m ³		
65.	98.	Nepheline syenite (total dust) [37244-96-5]	10 mg/m ³		
66a.	64a.	Nickel – Elemental/metal [7440-02-0]	1 mg/m ³ (I)		
66b.	64b.	Nickel – Insoluble compounds, as Ni [7440-02-0]	0.2 mg/m ³ (I)		
66c.	64c.	Nickel – Soluble compounds, as Ni [7440-02-0]	0.1 mg/m ³ (I)		
66d.	64d.	Nickel – Nickel subsulfide, as Ni [12035-72-2]	0.1 mg/m ³ (I)		
67.	8.	Nitrogen dioxide [10102-44-0]	3 ppm	5 ppm	
68.	65.	N-Nitrosamines, including n-Nitrosodimethylamine [62-75-9]	(L)		Skin
69.	9.	Nitrous oxide [10024-97-2]	25 ppm, or 45 mg/m ³		
70.	68.	Ozone [10028-15-6]	0.1 ppm, or 0.2 mg/m ³	0.3 ppm, or 0.6 mg/m ³	
71.	69.	Paraquat [4685-14-7]	0.1 mg/m ³		
72.	70.	Particles (Insoluble or Poorly Soluble) Not Otherwise Specified (PNOS)	10 mg/m ³ (I), or 3 mg/m ³ (R)		
73.	71.	Penicillin (total dust) [1406-05-9]	0.1 mg/m ³		
74.	101.	Pentaerythritol tetrabenzoate [4196-86-5]		2 mg/m ³	
75.	23.	Petroleum coke (total dust) [64741-79-3]	3.5 mg/m ³ (a)		
76.	72.	2-Phenoxyethanol [122-99-6]	25 ppm, or 141 mg/m ³		Skin
77a.	76a.	Platinum[7440-06-4] – Metal	1 mg/m ³		
77b.	76b.	Platinum[7440-06-4] – Water-soluble compounds of, including chloroplatinates (as Pt)	0.002 mg/m ³		
78.	13.	Polychlorinated biphenyls (PCBs) ²	0.05 mg/m ³		
79.	84.	Poultry dust (total dust)	5 mg/m ³		
80.	85.	1,2-Propylene glycol [57-55-6]	50 ppm (V), or 155 mg/m ³ (V), or 10 mg/m ³ (H)(b)		
81.	3.	Propylene glycol monomethyl ether acetate [108-65-6]	50 ppm, or 270 mg/m ³		
82.	88.	Selenium hexafluoride, as Se [7783-79-1]	0.025 ppm, or 0.1 mg/m ³		
83.	82.	Shellac dust (total dust) [9000-59-3]	10 mg/m ³		
84a.	91a.	*Silica, Crystalline – Quartz/Tripoli [14808-60-7; 1317-95-9]	0.10 mg/m ³ (R)		
84b.	91b.	*Silica, Crystalline – Cristobalite [14464-46-1]	0.05 mg/m ³ (R)		
85.	90.	Silica fume [69012-64-2]	2 mg/m ³ (R)		
86.	89.	Silica fused [60676-86-0]	0.1 mg/m ³ (R)		
87a.	92a.	Silicon carbide [409-21-2] – Non-fibrous	10 mg/m ³ (I)(E), or 3 mg/m ³ (R)(E)		
87b.	92b.	Silicon carbide [409-21-2] – Fibrous (including whiskers)	0.1 f/cc (R)(F)		
88.	83.	Sisal dust (total dust)	2 mg/m ³		
89.	81.	Soap dust [68918-36-5]	5 mg/m ³		
90.	95.	Spectinomycin [1695-77-8]	2 mg/m ³		
91.	93.	Stoddard Solvent –140°F Flash Aliphatic Solvent, Type of Stoddard Solvent	525 mg/m ³		
92.	96.	Styrene – monomer [100-42-5]	35 ppm	100 ppm	
93.	94.	Sulfur dioxide [7446-09-5]	2 ppm, or 5.2 mg/m ³	5 ppm, or 10.4 mg/m ³	
94a.	43a.	Synthetic Vitreous Fibres (Man Made Mineral Fibres) – Continuous filament glass fibres	5 mg/m ³ (I), or 1 f/cc (F)		
94b.	43b.	Synthetic Vitreous Fibres (Man Made Mineral Fibres) – Glass wool fibres	1 f/cc (F)		
94c.	43c.	Synthetic Vitreous Fibres (Man Made Mineral Fibres) – Refractory ceramic fibres	0.5 f/cc (F)		
94d.	43d.	Synthetic Vitreous Fibres (Man Made Mineral Fibres)	1 f/cc (F)		

		– Rock wool fibres			
94e.	43e.	Synthetic Vitreous Fibres (Man Made Mineral Fibres) – Slag wool fibres	1 f/cc (F)		
94f.	43f.	Synthetic Vitreous Fibres (Man Made Mineral Fibres) – Special purpose glass fibres	1 f/cc (F)		
94g.	43g.	Synthetic Vitreous Fibres (Man Made Mineral Fibres) – Synthetic Vitreous Fibres, not otherwise classified (excluding fibrous glass dust and mineral wool fibre)	1 f/cc (F)(c)		
95.	99.	Talc [14807-96-6], containing no asbestos	2 mg/m ³ (R)(E), or 2 f/cc (K)		
96.	100.	Tellurium hexafluoride, as Te [7783-80-4]	0.01 ppm, or 0.1 mg/m ³		
97.	6.	Tetrachlorophthalic anhydride [117-08-8]	0.1 mg/m ³		
98.	102.	Tetrachlorophenol [25167-83-3]	0.5 mg/m ³		Skin
99.	86.	Tetrasodium pyrophosphate [7722-88-5]	5 mg/m ³		
100a.	37a.	Tin, as Sn [7440-31-5] – Metal	2 mg/m ³		
100b.	37b.	Tin, as Sn [7440-31-5] – Oxide and inorganic compounds, as Sn, except tin hydride	2 mg/m ³		
100c.	37c.	Tin, as Sn [7440-31-5] – Organic compounds, as Sn	0.1 mg/m ³		Skin (organic compounds)
101.	105.	o-Tolidine [119-93-7]	(L)		Skin
102.	106.	Triethanolamine [102-71-6]	0.5 ppm, or 3.1 mg/m ³		
103.	107.	Triethylenediamine [280-57-9]	1 ppm, or 4.6 mg/m ³		Skin
104.	108.	Triethylenetetramine [112-24-3]	0.5 ppm, or 3 mg/m ³		Skin
105.	109.	Trimethoxyvinylsilane [2768-02-7]		10 ppm, or 60 mg/m ³	
106.	75.	Trixylylphosphate [25155-23-1]	0.1 mg/m ³		
107.	20.	*Vinyl chloride [75-01-04]	1 ppm		
108.	80.	Wheat flour dust (total dust)	3 mg/m ³		
109a.	78a.	Wood dust – Certain hardwoods as beech and oak	1 mg/m ³		
109b.	78b.	Wood dust – Softwood	5 mg/m ³	10 mg/m ³	

Endnotes and Abbreviations:

* Denotes a chemical agent listed in Table 1 of Ontario Regulation 490/09 (Designated Substances) made under the Act. See clause 2 (2) (a) of this Regulation.

¹ Means the benzene soluble fraction of total particulate matter of the substances emitted into the atmosphere from metallurgical coke ovens including condensed vapours and solid particulates.

² As sum of components assayed by chromatographic procedure with reference to the bulk sample.

[CAS No.] - CAS Registry Number.

f/cc - Fibres per cubic centimetre of air.

mg/m³ - Milligrams of the agent per cubic metre of air.

ppm - Parts of the agent per million parts of air by volume.

Skin - Danger of cutaneous absorption.

(E) The value is for particulate matter containing no asbestos and < 1 per cent crystalline silica.

(F) Respirable fibres: length > 5µm; aspect ratio ≥3:1, as determined by the membrane filter method at 400-450 times magnification (4-mm objective), using phase-contrast illumination.

(H) Aerosol only.

(I) Inhalable fraction: means that size fraction of the airborne particulate deposited anywhere in the respiratory tract and collected during air sampling with a particle size-selective device that, (a) meets the ACGIH particle size-selective sampling criteria for airborne particulate matter; and (b) has the cut point of 100 µm at 50 per cent collection efficiency.

- (K) Should not exceed 2 mg/m³ respirable particulate mass.
- (L) Exposure by all routes should be carefully controlled to levels as low as possible.
- (R) Respirable fraction: means that size fraction of the airborne particulate deposited in the gas-exchange region of the respiratory tract and collected during air sampling with a particle size-selective device that, (a) meets the ACGIH particle size-selective sampling criteria for airborne particulate matter; and (b) has the cut point of 4 µm at 50 per cent collection efficiency.
- (V) Vapour and aerosol.
- (a) Provided that the total dust contains less than 0.7 per cent vanadium.
- (b) For assessing the visibility in a work environment where 1,2-propylene glycol aerosol is present.
- (c) A secondary limit of 5 mg/m³ (total dust) is recommended to deal with dusty operations where fibre counts are usually difficult to determine. Where both types of measurements are made simultaneously, the more restrictive limit should be used to assess the exposures.

O. Reg. 274/14, s. 2.

SCHEDULE REVOKED: O. Reg. 491/09, s. 8.

SCHEDULE 1
AIRBORNE MEASUREMENT AND CALCULATION OF EXPOSURE

1. Airborne concentrations of a biological or chemical agent are expressed as,
 - (a) parts of the agent per million parts of air by volume (ppm);
 - (b) milligrams of the agent per cubic metre of air (mg/m³); or
 - (c) fibres per cubic centimetre of air (f/cc).
2. Air sampling of the airborne concentrations of the biological or chemical agent is not required for the full period of a work day or a work week if the air sampling is representative of airborne concentrations of the agent likely to be present during the full period.
3. The method of air sampling, the number and volume of the samples and the method of analysis of the samples shall be determined,
 - (a) according to the nature of the operations or processes and the characteristics of the biological or chemical agent; and
 - (b) in accordance with recognized industrial hygiene practice.
4. In determining exposure to airborne concentrations of the biological or chemical agent, no regard shall be had to the wearing or use of personal protective equipment.
5. The time-weighted average exposure to an airborne biological or chemical agent in a work day or work week shall be calculated as follows:

1. The cumulative daily or weekly exposure shall be calculated using the following formula:

$$C_1T_1 + C_2T_2 + \dots + C_nT_n$$

where,

C_1 is the concentration found in an air sample, and

T_1 is the total time in hours to which the worker is taken to be exposed to concentration C_1 in a work day or a work week.

2. The time-weighted average exposure shall be calculated by dividing the cumulative daily exposure by eight and the cumulative weekly exposure by 40 respectively.
6. Short-term exposures to the biological or chemical agent in any 15-minute period are determined from a single sample or from a time-weighted average of sequential samples taken during that period.
7. For mixtures of airborne chemical agents that exert an additive health effect, if analytical results of individual airborne agents are available, the following formula shall be used, subject to section 8 of this Schedule:

$$[(C_1/L_1) + (C_2/L_2) + \dots + (C_n/L_n)] = E$$

where,

C_1, C_2, \dots, C_n are the concentrations of the individual agents found in the air sample,

L_1, L_2, \dots, L_n are the respective exposure limits for the agents determined in accordance with the rules set out in section 4 of the Regulation,

and the sum of these ratios, E, shall not exceed 1.

8. If the agents in a mixture of airborne chemical agents have substantially different health effects,
 - i. section 7 of this Schedule does not apply, and
 - ii. exposure to each agent shall be calculated independently.

O. Reg. 491/09, s. 9.

[Français](#)

[Back to top](#)