

ONTARIO REGULATION 491/09
made under the
OCCUPATIONAL HEALTH AND SAFETY ACT

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Amending Reg. 833 of R.R.O. 1990
(Control of Exposure to Biological or Chemical Agents)

Note: Regulation 833 has previously been amended. For the legislative history of the Regulation, see the Table of Consolidated Regulations – Detailed Legislative History at www.e-Laws.gov.on.ca.

1. Section 1 of Regulation 833 of the Revised Regulations of Ontario, 1990 is revoked and the following substituted:

1. In this Regulation,

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

“ACGIH Table” means the table entitled “Adopted Values” shown at pages 10 to 61 of the publication entitled *2009 Threshold Limit Values and Biological Exposure Indices* published by ACGIH and identified by International Standard Book Number 978-1-882417-95-7;

“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;

“chemical agent” includes a chemical substance;

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

“Ontario Table” means Table 1 to this Regulation;

“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;

“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.

2. Section 2 of the Regulation is revoked and the following substituted:

2. (1) This Regulation does not apply, at a project,

- (a) to an employer who engages in construction; or
- (b) to workers of an employer described in clause (a) who are engaged in construction.

(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.

3. Subsection 3 (2) of the Regulation is revoked and the following substituted:

(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.

4. Section 4 of the Regulation is revoked and the following substituted:

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.

5. Sections 6 and 7 of the Regulation are revoked and the following substituted:

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.

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.

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.

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.

(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.

6. Subsections 8 (1), (2) and (3) of the Regulation are revoked and the following substituted:

- (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.

7. The Regulation is amended by adding the following Table:

TABLE 1
ONTARIO TABLE OF OCCUPATIONAL EXPOSURE LIMITS

Agent [CAS No.]	Time-Weighted Average Limit (TWA), Short-Term Exposure Limit (STEL), Ceiling Limit (C) and Notations		
	TWA	STEL/C	Notations
Acetic anhydride [108-24-7]		C 5 ppm C 21 mg/m ³	
*Acrylonitrile [107-13-1]	2 ppm	C 10 ppm	Skin
Aliphatic hydrocarbon gases			
Alkane [C ₁ -C ₄], except Butane, All isomers	1,000 ppm		
Butane, All isomers [106-97-8]; [75-28-5]	800 ppm		

*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	
*Asbestos – All forms [1332-21-4] Actinolite [77536-66-4] Amosite [12172-73-5] Anthophyllite [77536-67-5] Chrysotile [132207-32-0] Crocidolite [12001-28-4] Tremolite [77536-68-6]	0.1 f/cc (a) 0.1 f/cc (a) 0.1 f/cc (a) 0.1 f/cc (a) 0.1 f/cc (a) 0.1 f/cc (a) 0.1 f/cc (a)		
Benzaldehyde [100-52-7]		4 ppm 17 mg/m ³	
*Benzene [71-43-2]	0.5 ppm	2.5 ppm	Skin
Beryllium and its compounds, as Be [7440-41-7]	0.002 mg/m ³	0.01 mg/m ³	
sec-Butanol [78-92-2]	100 ppm	150 ppm	
tert-Butanol [75-65-0]	100 ppm	150 ppm	
Calcium chloride [10043-52-4]	5 mg/m ³		
Carbon monoxide [630-08-0]	25 ppm	100 ppm	
Carbon tetrachloride [56-23-5]	2 ppm	3 ppm	Skin
Charcoal, except activated [16291-96-6]	10 mg/m ³		
Chlordane [57-74-9]	0.5 mg/m ³	2 mg/m ³	Skin
Chlorinated diphenyl oxides [55720-99-5]	0.5 mg/m ³	2 mg/m ³	
o-Chlorobenzaldehyde [89-98-5]		4 ppm 23 mg/m ³	
Chlorobromomethane [74-97-5]	200 ppm	250 ppm	
Chlorodifluoromethane [75-45-6]	1,000 ppm	1,250 ppm	
Chlorodiphenyl (42% chlorine) [53469-21-9] Chlorodiphenyl (54% chlorine) [11097-69-1]	See listing for Polychlorinated Biphenyls (PCBs)		
Chloropicrin [76-06-2]	0.1 ppm	0.3 ppm	
o-Chlorotoluene [95-49-8]	50 ppm	75 ppm	
Clopidol [2971-90-6]	10 mg/m ³	20 mg/m ³	
N-Coco morpholine [1541-81-7]	5 ppm 52 mg/m ³		Skin
*Coke Oven Emissions ¹	0.15 mg/m ³		
Cotton dust, fabric knitting Cotton dust, raw Cotton dust, slashing and weaving Cotton dust, waste	0.5 mg/m ³ 0.2 mg/m ³ (G) 0.75 mg/m ³ (G) 0.5 mg/m ³ (G)		
'Coumin 100' Polymer Flakes (total dust) [63393-89-5]	5 mg/m ³		
Cruformate [299-86-5]	5 mg/m ³	20 mg/m ³	
Cymene (sum of o-,m-and p-isomers) [25155-15-1]	50 ppm 274 mg/m ³		Skin
Diacetone alcohol [123-42-2]	50 ppm 240 mg/m ³	75 ppm 360 mg/m ³	
Diatomaceous earth (uncalcined) [61790-53-2]	10 mg/m ³ (I)(E) 3 mg/m ³ (R)(E)		
1, 3-Dichloro-2-Propanol [96-23-1]		1 ppm 5 mg/m ³	Skin
1,2-Dichloroethylene, All isomers [540-59-0; 156-59-2; 156-60-5]	200 ppm 790 mg/m ³	250 ppm 990 mg/m ³	
Diethylene glycol monoethyl ether [111- 90-0]	30 ppm 165 mg/m ³		
Di(2-ethylhexyl)phthalate (DEHP) [117-81-7]	3 mg/m ³	5 mg/m ³	
Diisodecyl phthalate [26761-40-0]	5 mg/m ³		
3-(Dimethylamino) propylamine [109-55-7]	0.5 ppm 2 mg/m ³		Skin
N, N-Dimethyl-cyclohexylamine [98-94-2]		5 ppm 26 mg/m ³	
N, N-Dimethyl-ethanolamine [108-01-0]	3 ppm 11 mg/m ³	6 ppm 22 mg/m ³	
Dimethyl terephthalate [120-61-6]	5 mg/m ³		
Dimethyl 2,3,5,6-tetrachloroterephthalate [1861-32-1]	5 mg/m ³		
Dipropylene glycol monomethyl ether acetate [88917-22-0]	100 ppm 776 mg/m ³	150 ppm 1,164 mg/m ³	

Diquat [2764-72-9; 85-00-7; 6385-62-2]	0.5 mg/m ³ 0.1 mg/m ³ (R)		Skin
Enflurane [13838-16-9]	2 ppm 16 mg/m ³		
Ethyl-3-ethoxy propionate [763-69-9]	50 ppm 300 mg/m ³		
Ethylene dibromide [106-93-4]	(L)		Skin
Ethylene glycol dimethyl ether [110-71-4]	5 ppm 18 mg/m ³		Skin
Ethylene glycol mono-n-propyl ether [2807-30-9]	25 ppm 110 mg/m ³		Skin
Ethylene glycol mononitrate [16051-48-2]	0.05 ppm 0.22 mg/m ³		Skin
*Ethylene oxide [75-21-8]	1 ppm 1.8 mg/m ³	10 ppm 18 mg/m ³	
Ethyl methacrylate [97-63-2]	100 ppm 470 mg/m ³		
Flour dust	See listing for Wheat Flour Dust (total dust)		
Forane [26675-46-7]	2 ppm 15 mg/m ³		
Formaldehyde [50-00-0]		STEL 1 ppm C 1.5 ppm	
Halothane [151-67-7]	2 ppm 16 mg/m ³		
Heptyl acetate [112-06-1]	50 ppm 320 mg/m ³		
Hexamethylenetetramine (HMT) [100-97-0]		0.35 ppm 2 mg/m ³	
Hexamethyl phosphoramidate [680-31-9]	(L)		Skin
Hexyl acetate (isomeric mixture)[88230-35-7]	50 ppm 294 mg/m ³		
Hydrogenated terphenyls ² [61788-32-7]	0.5 ppm		
Isobutyl acetate [110-19-0]	150 ppm	187 ppm	
*Isocyanates, organic compounds Toluene diisocyanate (TDI) [584-84-9] [91-08-7] Methylene bisphenyl isocyanate (MDI) [101-68-8] Hexamethylene diisocyanate (HDI) [822-06-0] Isophorone diisocyanate (IPDI) [4098-71-9] Methylene bis (4-cyclohexylisocyanate) [5124-30-1]	0.005 ppm 0.005 ppm 0.005 ppm 0.005 ppm 0.005 ppm	C 0.02 ppm C 0.02 ppm C 0.02 ppm C 0.02 ppm C 0.02 ppm	
Isopropylaminoethanols [109-56-8] [121-93-7]		400 ppm 1,900 mg/m ³	
Isosorbide dinitrate [87-33-2]	0.2 mg/m ³		Skin
* Lead [7439-92-1] elemental lead, inorganic and organic compounds of lead, as Pb Elemental lead, inorganic and organic compounds of lead, as Pb except tetraethyl lead [78-00-2] Tetraethyl lead, as Pb [78-00-2]	0.05 mg/m ³ 0.10 mg/m ³	0.30 mg/m ³	Skin (organic compounds)
* Lead chromate [7758-97-6] as Pb (see listing for lead [7439-92-1]) as Cr	0.05 mg/m ³ 0.012 mg/m ³		
Lincomycin [154-21-2]	0.1 mg/m ³		
Lithium hydroxide Anhydrous [1310-65-2] Monohydrate [1310-66-3]		1 mg/m ³ 1 mg/m ³	
Magnesite (total dust) [546-93-0]	10 mg/m ³ (E)		
*Mercury [7439-97-6], elemental mercury, inorganic and organic compounds of mercury, as Hg All forms of except alkyl, as Hg Alkyl compounds of, as Hg	0.025 mg/m ³ 0.01 mg/m ³	0.03 mg/m ³	Skin Skin
Methoxyflurane [76-38-0]	2 ppm 13 mg/m ³		
Methyl acetylene [74-99-7]	1,000 ppm	1,250 ppm	
Methyl n-amyl ketone [110-43-0]	25 ppm		

	115 mg/m ³		
Methyl tert-butyl ether (MTBE) [1634-04-4]	40 ppm		
Methyl n-butyl ketone [591-78-6]	1 ppm 4 mg/m ³		Skin
4,4'-Methylene bis(2-chloroaniline) (MBOCA; MOCA®) [101-14-4]	0.0005 ppm 0.005 mg/m ³		Skin
4,4'-Methylene dianiline [101-77-9]	0.04 mg/m ³		Skin
N-Methyl-2-pyrrolidone [872-50-4]	400 mg/m ³		
Mineral Spirits	525 mg/m ³		
Morpholine [110-91-8]	20 ppm 70 mg/m ³	30 ppm 105 mg/m ³	Skin
Nepheline syenite (total dust) [37244-96-5]	10 mg/m ³		
Nickel Elemental/metal [7440-02-0] Insoluble compounds, as Ni [7440-02-0] Soluble compounds, as Ni [7440-02-0] Nickel subsulfide, as Ni [12035-72-2]	1 mg/m ³ (I) 0.2 mg/m ³ (I) 0.1 mg/m ³ (I) 0.1 mg/m ³ (I)		
2-Nitropropane [79-46-9]	10 ppm 35 mg/m ³	20 ppm 70 mg/m ³	
N-Nitrosamines, including n-Nitrosodimethylamine [62-75-9]	(L)		Skin
Nitrous oxide [10024-97-2]	25 ppm 45 mg/m ³		
Ozone [10028-15-6]	0.1 ppm 0.2 mg/m ³	0.3 ppm 0.6 mg/m ³	
Paraquat [4685-14-7]	0.1 mg/m ³		
Particles (Insoluble or Poorly Soluble) Not Otherwise Specified (PNOS)	10 mg/m ³ (I) 3 mg/m ³ (R)		
Penicillin (total dust) [1406-05-9]	0.1 mg/m ³		
Pentaerythritol tetrabenzoate [4196-86-5]		2 mg/m ³	
Pentane, All isomers [78-78-4; 109-66-0; 463-82-1]	600 ppm 1,770 mg/m ³	750 ppm 2,210 mg/m ³	
Perlite	10 mg/m ³ (E)		
Petroleum coke (total dust) [64741-79-3]	3.5 mg/m ³ (b)		
2-Phenoxyethanol [122-99-6]	25 ppm 141 mg/m ³		Skin
Phosphorus oxychloride [10025-87-3]	0.1 ppm 0.6 mg/m ³	0.5 ppm 3 mg/m ³	
Picloram [1918-02-1]	10 mg/m ³	20 mg/m ³	
Picric acid [88-89-1]	0.1 mg/m ³	0.3 mg/m ³	Skin
Platinum [7440-06-4] Metal Water-soluble compounds of, including chloroplatinates (as Pt)	1 mg/m ³ 0.002 mg/m ³		
Polychlorinated biphenyls (PCBs) ²	0.05 mg/m ³		
Poultry dust (total dust)	5 mg/m ³		
Precipitated silica (total dust) [1343-98-2]	10 mg/m ³		
1,2-Propylene glycol [57-55-6]	50 ppm (V) 155 mg/m ³ (V) 10 mg/m ³ (H)(c)		
Propylene glycol monomethyl ether acetate [108-65-6]	50 ppm 270 mg/m ³		
Selenium hexafluoride [7783-79-1], as Se	0.025 ppm 0.1 mg/m ³		
Shellac dust (total dust) [9000-59-3]	10 mg/m ³		
* Silica, Crystalline Quartz/Tripoli [14808-60-7; 1317-95-9] Cristobalite [14464-46-1]	0.10 mg/m ³ (R) 0.05 mg/m ³ (R)		
Silica fume [69012-64-2]	2 mg/m ³ (R)		
Silica fused [60676-86-0]	0.1 mg/m ³ (R)		
Silica gel [112926-00-8]	10 mg/m ³		
Silicon (total dust) [7440-21-3]	10 mg/m ³		
Silicon carbide [409-21-2] Non-fibrous	10 mg/m ³ (I) (E)		

Fibrous (including whiskers)	3 mg/m ³ (R)(E) 0.1 f/cc (R)(F)		
Sisal dust (total dust)	2 mg/m ³		
Soap dust [68918-36-5]	5 mg/m ³		
Sodium fluoroacetate [62-74-8]	0.05 mg/m ³	0.15 mg/m ³	Skin
Spectinomycin [1695-77-8]	2 mg/m ³		
140 Degree C Flash Aliphatic Solvent, Type of Stoddard Solvent	525 mg/m ³		
Styrene - monomer [100-42-5]	35 ppm	100 ppm	
Sulfur dioxide [7446-09-5]	2 ppm 5.2 mg/m ³	5 ppm 10.4 mg/m ³	
Synthetic Vitreous Fibres (Man Made Mineral Fibres) Continuous filament glass fibres Continuous filament glass fibres Glass wool fibres Refractory ceramic fibres Rock wool fibres Slag wool fibres Special purpose glass fibres Synthetic Vitreous Fibres, not otherwise classified (excluding fibrous glass dust and mineral wool fibre)	5 mg/m ³ (I) 1 f/cc (F) 1 f/cc (F) 0.5 f/cc (F) 1 f/cc (F) 1 f/cc (F) 1 f/cc (F) 1 f/cc (F)(d)		
Talc [14807-96-6], containing no asbestos	2 mg/m ³ (R)(E) 2 f/cc (K)		
Tantalum, metal and oxide (total dust) [7440-25-7]	10 mg/m ³		
Tellurium hexafluoride [7783-80-4], as Te	0.01 ppm 0.1 mg/m ³		
Tetrachlorophthalic anhydride [117-08-8]	0.1 mg/m ³		
Tetrachlorophenol [25167-83-3]	0.5 mg/m ³		Skin
Tetrasodium pyrophosphate [7722-88-5]	5 mg/m ³		
Tin [7440-31-5], as Sn Metal Oxide and inorganic compounds, as Sn, except tin hydride Organic compounds, as Sn	2 mg/m ³ 2 mg/m ³ 0.1 mg/m ³		Skin (organic compounds)
o-Tolidine [119-93-7]	(L)		Skin
Triethanolamine [102-71-6]	0.5 ppm 3.1 mg/m ³		
Triethylenediamine [280-57-9]	1 ppm 4.6 mg/m ³		Skin
Triethylenetetramine [112-24-3]	0.5 ppm 3 mg/m ³		Skin
Trimethoxyvinylsilane [2768-02-7]		10 ppm 60 mg/m ³	
2,4,6-Trinitrotoluene (TNT) [118-96-7]	0.01 ppm 0.1 mg/m ³	0.02 ppm 0.2 mg/m ³	Skin
Trixylylphosphate [25155-23-1]	0.1 mg/m ³		
Vegetable oils (mists) except mists of irritant oils such as oils of castor and cashew nut	10 mg/m ³		
*Vinyl chloride [75-01-04]	1 ppm		
Vinylidene chloride [75-35-4]	1 ppm 4 mg/m ³	20 ppm 80 mg/m ³	
Wheat flour dust (total dust)	3 mg/m ³		
Wood dust Certain hardwoods as beech and oak Softwood	1 mg/m ³ 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.

(G) As measured by the vertical elutriator, cotton-dust sampler.

(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) Asbestos fibres longer than 5 µm in length and less than 3 µm in width and that have a length to width ratio not less than 3:1 as viewed in a phase contrast optical microscope at 400-450 times magnification.

(b) Provided that the total dust contains less than 0.7 per cent vanadium.

(c) For assessing the visibility in a work environment where 1,2-propylene glycol aerosol is present.

(d) 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.

8. The Schedule to the Regulation is revoked.

9. The Regulation is amended by adding the following Schedule:

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:

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

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.

10. This Regulation comes into force on the later of July 1, 2010 and the day this Regulation is filed.

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ONTARIO REGULATION 248/08

made under the

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(Control of Exposure to Biological or Chemical Agents)

Note: Regulation 833 has previously been amended. Those amendments are listed in the Table of Current Consolidated Regulations – Legislative History Overview which can be found at www.e-Laws.gov.on.ca.

1. (1) Part 4 of Regulation 833 of the Revised Regulations of Ontario, 1990 is amended by striking out,

Aldrin (309-00-2) — Skin		0.25				
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Arsine (7784-42-1)	0.05	0.16				
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Calcium carbonate (471-34-1)		10 (D)				
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Coumaphos, inhalable, vapour and aerosol (56-72-4) — Skin		0.5				
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Limestone (total dust) (1317-65-3)		10 (D)				
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Methylbenzene (108-88-3)	50					
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Methyl demeton (8022-00-2) — Skin		0.5				
2-Methyl-3,5-dinitrobenzamide (148-01-6)		5		10		

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5-Methyl-3-heptanone (541-85-5)	25	130				
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.

2,2'-(Oxybis(methylene)) - bisoxirane (2238-07-5)	0.1	0.53				
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2-Pentanone (107-87-9)	200	700	250	880		
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.

n-Propanol, also known as n-Propyl alcohol (71-23-8)	200	490	250	615		
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Tetraethyl pyrophosphate (107-49-3) — Skin	0.004	0.047				
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Tetrahydrofuran (109-99-9)	200	590	250	735		
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.

Trichloroethylene (79-01-6)	50		100			
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(2) Part 4 of the Regulation is amended by adding the following:

Alachlor, inhalable aerosol and vapour (15972-60-8)			1			
Aldrin, inhalable aerosol and vapour (309-00-2) — Skin			0.05			

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Arsine (7784-42-1)	0.005					
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Coumaphos, inhalable aerosol and vapour (56-72-4) — Skin			0.05			
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Diglycidyl ether (DGE), also known as 2,2'-(Oxybis(methylene))-bisoxirane (2238-07-5)	0.01					
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Dimethyl carbamoyl chloride (79-44-7) — Skin	0.005					
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Dimethyl disulfide (624-92-0) — Skin	0.5					
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3,5-Dinitro-o-toluamide, also known as 2-Methyl-3,5-dinitrobenzamide and Dinitolmide (148-01-6)			1			
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Ethyl amyl ketone, also known as 5-Methyl-3-heptanone (541-85-5)	10					
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Hexafluoropropylene (116-15-4)	0.1					
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.

Methyl demeton, inhalable aerosol and vapour (8022-00-2) — Skin		0.05				
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1-Methyl naphthalene (90-12-0) — Skin	0.5					
2-Methyl naphthalene (91-57-6) — Skin	0.5					

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Methyl propyl ketone, also known as 2-Pentanone (107-87-9)			150			
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5-Nitro-o-toluidine, inhalable (99-55-8)		1				
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.

n-Propanol, also known as n-Propyl alcohol (71-23-8)	100					
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Tetraethyl pyrophosphate (TEPP), inhalable aerosol and vapour (107-49-3) — Skin		0.01				
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Tetrahydrofuran (109-99-9) — Skin	50		100			
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Toluene, also known as Methylbenzene (108-88-3)	20					
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Trichloroethylene (79-01-6)	10		25			
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2. Part 10 of the Regulation is amended by striking out,

Dimethylcarbamoyl chloride	(79-44-7)
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3. This Regulation comes into force on the day it is filed.

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ONTARIO REGULATION 83/07
 made under the
OCCUPATIONAL HEALTH AND SAFETY ACT

Made: March 7, 2007
 Filed: March 9, 2007
 Published on e-Laws: March 12, 2007
 Printed in *The Ontario Gazette*: March 24, 2007

Amending Reg. 833 of R.R.O. 1990
 (Control of Exposure to Biological or Chemical Agents)

Note: Regulation 833 has previously been amended. Those amendments are listed in the Table of Regulations – Legislative History Overview which can be found at www.e-Laws.gov.on.ca.

1. (1) Part 4 of the Schedule to Regulation 833 of the Revised Regulations of Ontario, 1990 is amended by striking out,

Calcium sulfate, including plaster of Paris (total dust) (10101-41-4)		10				
.						
Carbon disulfide (75-15-0) — Skin	10	31				
.						
1,2-Dichloropropane (78-87-5)	75	350	110	510		
.						
Fenamiphos (22224-92-6) — Skin		0.1				
.						
Fenthion (55-38-9) — Skin		0.1				
.						
Fonofos (944-22-9) — Skin		0.1				
.						
Gypsum (total dust) (10101-41-4)		10				
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Iron oxide (Fe₂O₃) dust and fume (as Fe) (1309-37-1)		5				
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2-Methoxyethanol (EGME) (109-86-4) — Skin	5	16				
2-Methoxyethyl acetate (EGMEA) (110-49-6) — Skin	5	24				

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Ronnel (299-84-3)		10				
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Rouge (total dust) (1309-37-1)		10(D)				
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1,1,2,2-Tetrabromoethane (79-27-6)	1	14				
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(2) Part 4 of the Schedule to the Regulation is amended by adding,

Calcium sulfate, inhalable, including Gypsum and plaster of Paris (7778-18-9; 10034-76-1; 10101-41-4; 13397-24-5)		10				
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Carbon disulfide (75-15-0) — Skin	1					
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Coumaphos, inhalable, vapour and aerosol (56-72-4) — Skin		0.5				
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Fenamiphos, inhalable, vapour and aerosol (22224-92-6) — Skin		0.05				
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Fenthion, inhalable, vapour and aerosol (55-38-9) — Skin		0.05				
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Fonofos, inhalable, vapour and aerosol (944-22-9) — Skin		0.01				
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Iron oxide (Fe ₂ O ₃), respirable, including Rouge (1309-37-1)		5				
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2-Methoxyethanol (EGME) (109-86-4) — Skin	0.1					
2-Methoxyethyl acetate (EGMEA) (110-49-6) — Skin	0.1					

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Monochloroacetic acid, inhalable, vapour and aerosol (79-11-8) — Skin		0.5				
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Propylene (115-07-1)	500					
Propylene dichloride, also known as 1,2-Dichloropropane (78-87-5)	10					

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Ronnel, inhalable, vapour and aerosol (299-84-3)		5				
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1,1,2,2-Tetrabromoethane, inhalable, vapour and aerosol (79-27-6)		0.1				
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2. Part 9 of the Schedule to the Regulation is amended by striking out,

Propylene	(115-07-1)
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