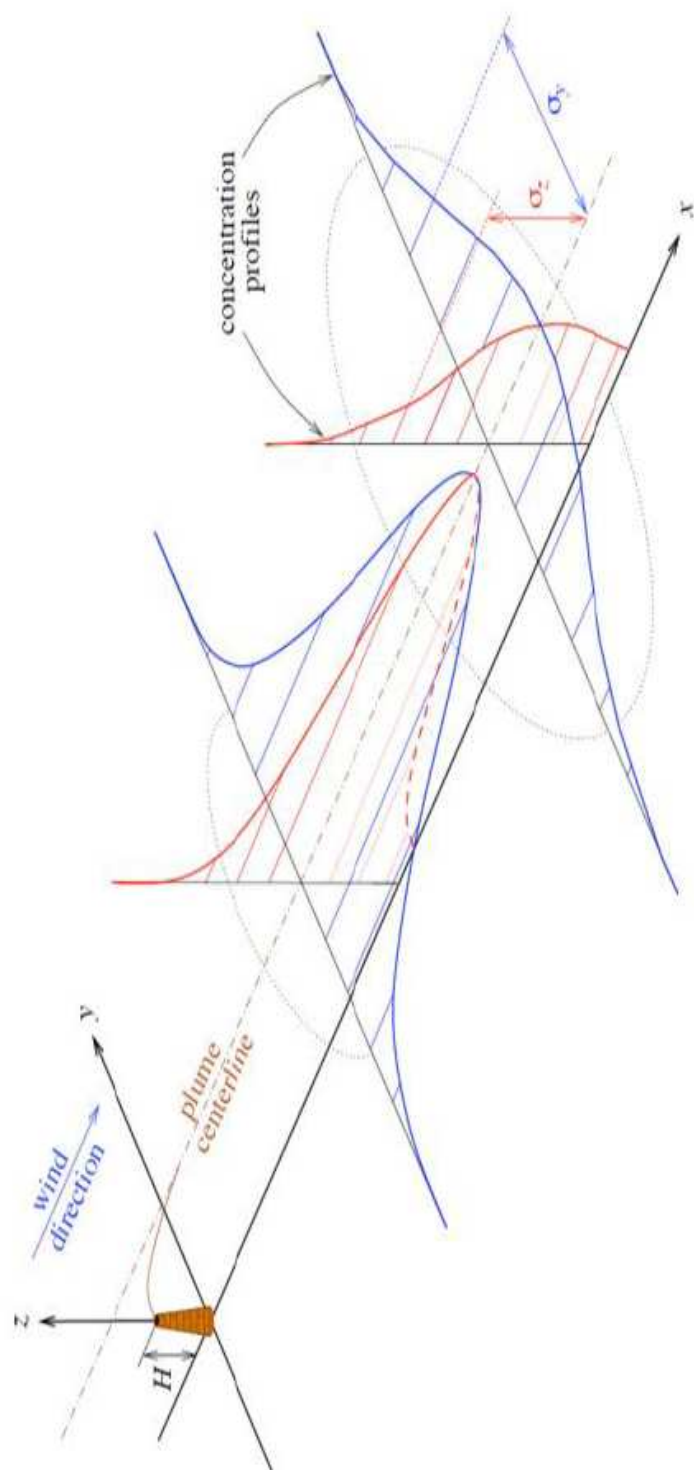


Use of AEGL Dosage in Safety and Risk Studies



An ioMosaic Corporation White
Paper

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IO MOSAIC CORPORATION

Risk Management and Assessment Practices

Use of AEGL Dosage in Safety and Risk Studies

authored by

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1 Introduction

Safety and risk analysis studies involving toxic chemicals often require the use of limiting toxicity criteria to develop safe exclusion zones, individual risk profiles, and/or societal risk profiles. For a short duration release, a fixed concentration criteria may overpredict the extent of hazard or risk. For a long duration release the extent of hazard may be underpredicted if the dose response is nonlinear. The most appropriate and direct approach is to use a dose response curve to determine the extent of risk. This is typically referred to as a vulnerability model or a probit (see Section 3) where the extent of risk or hazard is expressed as a probability of receiving a specific dose which depends on both concentration and exposure time.

Adequate probit models are only available for a limited number chemicals. They are mostly used in quantitative risk assessment studies. Probit models are not typically used to develop safe separation zones for safety studies in the United States because they relate the probability of fatality or the probability of receiving a dangerous dose to an exposure level and duration. Concentration based criteria such as emergency response planning guidelines (ERPG) are typically used because of the quality and the level of peer review provided by the American Industrial Hygiene Association (AIHA). ERPG guidelines are based on 60 minutes of exposure time and do not explicitly provide the nonlinearity of dose-response to use directly in transient dispersion models.

2 Acute Exposure Level Guidelines (AEGs)

AEGs provide concentration limits for different exposure durations. They are designed to protect the elderly, children, and other individuals who may be susceptible. Similar to ERPG levels, AEGs are assigned levels of 1, 2 or 3 according to severity of effects. AEGs are calculated for five relatively short exposure periods 10 minutes, 30 minutes, 1 hour, 4 hours, and 8 hours. AEG levels are dictated by the severity of the toxic effects caused by the exposure, with Level 1 being the least and Level 3 being the most severe. AEGs are developed based on formal guidance provided by the national research council (NRC). Published AEG values can be found on EPA's web site <https://www.epa.gov/aegl>. In 2001, the National Academies [1] published procedural guidance to make development of AEGs systematic, consistent, documented and transparent to the public.

AEG levels can be expressed in parts per million (ppm) or milligrams per cubic meter (mg/m³) of a substance above which it is predicted that the general population (including susceptible individuals) could experience one of the following responses to exposure:

AEG-1: Notable discomfort, irritation, or certain asymptomatic non-sensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEG-2: Irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEG-3: Life-threatening health effects or death.

AEG values represent threshold levels for the general public including susceptible subpopulations, such as infants, children, the elderly, persons with asthma, and those with other illnesses.

Some individuals, subject to unique or idiosyncratic responses, could experience the effects described at concentrations below the corresponding AEGL.

Airborne concentrations below the AEGL-1 represent exposure levels that could produce mild and progressively increasing but transient and non-disabling odor, taste, and sensory irritation or certain asymptomatic, non-sensory effects.

3 Probit Models

The method of probit analysis [2] was first introduced between 1940 and 1950. A probit (probability unit, Y) is a normally distributed random variable with a mean of 5 and a standard deviation of 1. The probability of receiving a specific dose is expressed as:

$$P = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{Y-5} \exp - \left(\frac{u^2}{2} \right) du = \frac{1}{2} + \frac{1}{2} \operatorname{erf} \left(\frac{Y-5}{\sqrt{2}} \right) \quad (1)$$

$P = 0.01$ (1 %) when $Y = 2.67$, $P = 0.5$ (50 %) when $Y = 5$, and $P = 0.99$ (99 %) when $Y = 7.33$.

For response to a toxic exposure of concentration C and duration t , Y is given by:

$$Y = A + B \ln \left[\int C^N dt \right] \quad (2)$$

where the integral containing concentration represents a dose factor. If C does not vary with time, then Y can be expressed as:

$$Y = A + B \ln [C^N t] \quad (3)$$

When the probit exponent N is less or equal to 1, the duration of exposure tends to dominate the dose response. For values of N exceeding 1 the concentration dominates the dose response.

Expanding equation 3 yields a log-linear expression of Y as a function of C and t :

$$Y = A + NB \ln (C) + B \ln (t) \quad (4)$$

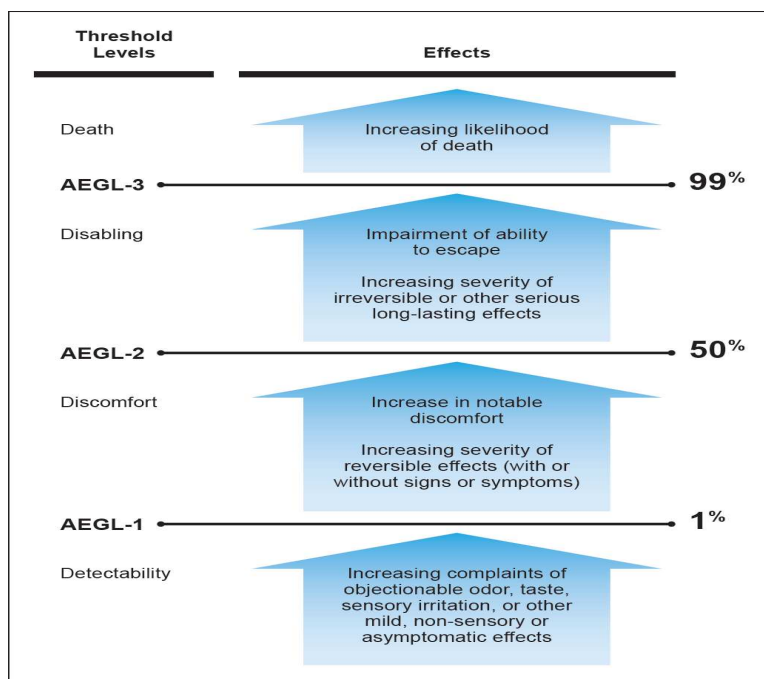
Regression of Y as a function of $\ln (C)$ and $\ln (t)$ will provide the probit model constants N , A , and B . The slope of a plot showing $\ln (C)$ vs. $\ln (t)$ yields the value of $-\frac{1}{N}$:

$$\ln (C) = \frac{Y - A}{NB} - \frac{1}{N} \ln (t) \quad (5)$$

4 Conversion of AEGL Limits to Dose Response Models

Because AEGL limits are provided for specific durations, they can be used to establish nonlinear dose response criteria to be used with transient dispersion models to develop safe exclusion zones for emergency response planning. With increasing airborne concentrations above each AEGL, there is a progressive increase in the likelihood of occurrence and the severity of effects described for each corresponding AEGL. This is shown in Figure 1. We assign a probability of 1 % of being exposed to a "dangerous dose" to the dose-response implied by AEGL-1, 50 % to AEGL-2 and 99 % to AEGL-3. Once these probabilities are assigned, a probit model can be developed based on the published AEGL data. The developed probit model can be used with a transient dispersion model such as the Gaussian puff model to determine safe separation distance at AEGL-1 by specifying a probability of receiving a dangerous dose of 1 %, at AEGL-2 by using 50 %, and so on.

Figure 1: Proposed AEGL Dose Response Probit Limits



5 Case Study

Table 1 shows the current AEGL values for several cyanates. This data is regressed using the selective regression tools available in the Process Safety Office[®] component SuperChems Expert[™]. Selective regression is a powerful and useful tool for the development of predictive models by optimizing sum of squares and inter-correlation between model independent variables.

The regression results are shown in Table 2. We note that for cyanates the concentration exponent is close to 3 as reported by others [3] in the open literature. A coefficient of correlation of 94 % is obtained for hydrogen cyanide with a low degree of inter-correlation between concentration and exposure time.

Table 1: Selected AEGL values for cyanates

Chemical Name	CAS Number	AEGL Level	10 min	30 min	60 min	4 hr	8 hr	Concentration unit
Hydrogen Cyanide	74-90-8	1	2.5	2.5	2.0	1.3	1.0	ppm
		2	17.0	10.0	7.1	3.5	2.5	
		3	27.0	21.0	15.0	8.6	6.6	
Sodium Cyanide	143-33-9	1	5.0	5.0	4.0	2.6	2.0	mg/m ³
		2	34.0	20.0	14.0	7.0	5.0	
		3	54.0	42.0	30.0	17.0	13.0	
Potassium Cyanide	151-50-8	1	6.6	6.6	5.3	3.5	2.7	mg/m ³
		2	45.0	27.0	19.0	9.3	6.6	
		3	72.0	56.0	40.0	23.0	18.0	
Calcium Cyanide	592-01-8	1	4.7	4.7	3.8	2.4	1.9	mg/m ³
		2	32.0	19.0	13.0	6.6	4.7	
		3	51.0	39.0	28.0	16.0	12.0	
Methyl Isothiocyanate	556-61-6	1	0.27	0.27	0.27	0.27	0.27	ppm
		2	21.0	21.0	17.0	10.0	5.3	
		3	63.0	63.0	50.0	31.0	16.0	
2,4-Toluene Diisocyanate	584-84-9	1	0.02	0.02	0.02	0.01	0.01	ppm
		2	0.24	0.17	0.083	0.021	0.021	
		3	0.65	0.65	0.51	0.32	0.16	

Application of the dose response model for hydrogen cyanide using a concentration of 2.0 ppm and an exposure duration of 60 minutes yields the following probit values:

$$Y = -2.0437 + 0.8049 \times \ln(2.0^{2.661} \times 60) = 2.73 \quad (6)$$

$$P = 1.16\% \quad (7)$$

6 Selective Regression of AEGL Data with SuperChems Expert

The AEGL data is first reduced into a simple ASCII data file. This is shown in Figure 2.

The data is then imported into SuperChems Expert. After the data import is completed, SuperChems Expert displays summary information about the data set. Selecting the "Analyze" option in SuperChems Expert launches the Selective Regression [4, 5] control panel. The control panel provides numerous capabilities including options for the transformation and the visualization of data. Figure 3 shows the final Selective Regression tableaux [4, 5] with regression statistics.

As shown in Figure 3, a good predictive model is one that uses the least number of independent parameters with a high coefficient of correlation and a low degree on inter-correlation between independent variables.

Table 2: Regressed probit model parameters for cyanates

Chemical Name	CAS Number	A	B	N	R^2_Y	$R^2_{\ln(C)}$	Concentration unit
Hydrogen Cyanide	74-90-8	-2.0437	0.8049	2.661	0.946	0.269	ppm
Sodium Cyanide	143-33-9	-3.5551	0.8097	2.651	0.946	0.271	mg/m ³
Potassium Cyanide	151-50-8	-4.0848	0.7953	2.683	0.946	0.264	mg/m ³
Calcium Cyanide	592-01-8	-3.4522	0.8146	2.642	0.945	0.274	mg/m ³
Methyl Isothiocyanate	556-61-6	+2.7960	0.1939	4.288	0.890	0.022	ppm
2,4-Toluene Diisocyanate	584-84-9	+5.9940	0.5677	2.331	0.933	0.156	ppm

7 Conclusions

We have demonstrated that AEGL limits can be used to develop useful dose response models. The AEGL dose response models can easily be coupled with transient dispersion models to provide a more realistic estimate of potential hazard zones for emergency response planning. This approach is advantageous because both concentration and exposure time are used to determine the extent of potential hazard regardless of scenario duration.

Figure 2: HCN AEGL ASCII data file

```
C
C HCN AEGL Data set
C
DataSet = "HCN AEGL"

Describe 1 "Y" "Probit Value"
Describe 2 "C" "Cocentration, ppm"
Describe 3 "t" "Exposure time, min"

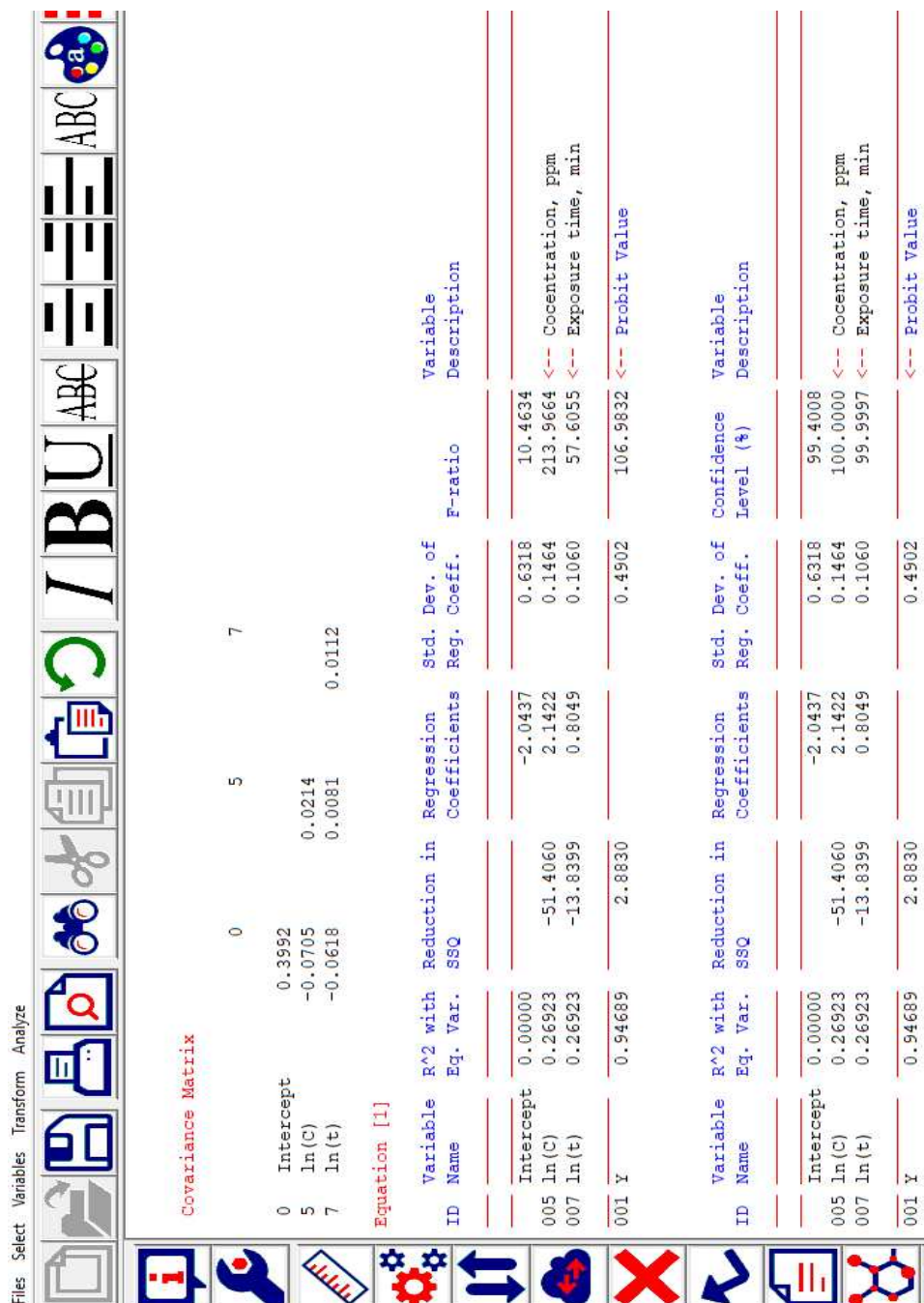
Reference = "Cameo/EPA Data"

MaxRows = 36
MaxCols = 6

"START"
2.67  2.5 10
2.67  2.5 30
2.67  2.0 60
2.67  1.3 240
2.67  1.0 480
5.0   17.0 10
5.0   10.0 30
5.0   7.1  60
5.0   3.5 240
5.0   2.5 480
7.33  27.0 10
7.33  21.0 30
7.33  15.0 60
7.33  8.6 240
7.33  6.6 480
"END"

Analyze 1 2 3
```

Figure 3: HCN AEGL ASCII data file



A AEGL Values for Chemicals (<https://www.epa.gov/aegl>)

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- [2] D. J. Finney. *Probit analysis*. Cambridge University Press, 1977.
- [3] W. F. ten Berge, A. Zwart, and L. M. Appelman. Concentration-time mortality response relationships of irritant and systemically acting vapours and gases. *Journal of hazardous materials*, 13:301–309, 1986.
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About the Author



Dr. Melhem is an internationally known pressure relief and flare systems, chemical reaction systems, process safety, and risk analysis expert. In this regard he has provided consulting, design services, expert testimony, incident investigation, and incident reconstruction for a large number of clients. Since 1988, he has conducted and participated in numerous studies focused on the risks associated with process industries fixed facilities, facility siting, business interruption, and transportation.

Prior to founding ioMosaic Corporation, Dr. Melhem was president of Pyxsys Corporation; a technology subsidiary of Arthur D. Little Inc. Prior to Pyxsys and during his twelve years tenure at Arthur D. Little, Dr. Melhem was a vice president of Arthur D. Little and managing director of its Global Safety and Risk Management Practice and Process Safety and Reaction Engineering Laboratories.

Dr. Melhem holds a Ph.D. and an M.S. in Chemical Engineering, as well as a B.S. in Chemical Engineering with a minor in Industrial Engineering, all from Northeastern University. In addition, he has completed executive training in the areas of Finance and Strategic Sales Management at the Harvard Business School. Dr. Melhem is a Fellow of the American Institute of Chemical Engineers (AIChE) and Vice Chair of the AIChE Design Institute for Emergency Relief Systems (DiERS).

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About ioMosaic Corporation

Through innovation and dedication to continual improvement, ioMosaic has become a leading provider of integrated process safety and risk management solutions. ioMosaic has expertise in a wide variety of areas, including pressure relief systems design, process safety management, expert litigation support, laboratory services, training and software development.

As a certified ISO 9001:2015 Quality Management System (QMS) company, ioMosaic offers integrated process safety and risk management services to help you manage and reduce episodic risk. Because when safety, efficiency, and compliance are improved, you can sleep better at night. Our extensive expertise allows us the flexibility, resources, and capabilities to determine what you need to reduce and manage episodic risk, maintain compliance, and prevent injuries and catastrophic incidents.

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- Training

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- Chemical Reactivity
- Combustible Dust
- Battery Safety
- Specialized Testing

COMPILED AEGL VALUES

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Magnesium aluminum phosphide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	1.3	1.3	0.67	0.17	0.080
AEGL 3	2.4	2.4	1.2	0.30	0.15

NR = Not recommended due to insufficient data

56-23-5 Carbon tetrachloride (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	27	18	13	7.6	5.8
AEGL 3	700	450	340	200	150

NR = Not recommended due to insufficient data

57-14-7 1,1- Dimethyl hydrazine (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	18	6.0	3.0	0.75	0.38
AEGL 3	65	22	11	2.7	1.4

NR = Not recommended due to insufficient data

60-34-4 Methyl hydrazine (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	5.3	1.8	0.90	0.23	0.11
AEGL 3	16	5.5	2.7	0.68	0.34

NR = Not recommended due to insufficient data

62-53-3 Aniline (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	48	16	8.0	2.0	1.0
AEGL 2	72	24	12	3.0	1.5
AEGL 3	120	40	20	5.0	2.5

67-66-3 Chloroform (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	120	80	64	40	29
AEGL 3	4,000	4,000	3,200	2,000	1,600

NR = Not recommended due to insufficient data

68-12-2 N,N-Dimethylformamide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	110	110	91	57	38
AEGL 3	970	670	530	280	140

NR = Not recommended due to insufficient data

74-83-9 Methyl bromide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	940	380	210	67	67
AEGL 3	3,300	1,300	740	230	130

NR = Not Recommended due to insufficient data

74-87-3 Methyl chloride (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	1,100	1,100	910	570	380
AEGL 3	3,800	3,800	3,000	1,900	1,300

NR = Not Recommended due to insufficient data

74-90-8 Hydrogen cyanide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	2.5	2.5	2.0	1.3	1.0
AEGL 2	17	10	7.1	3.5	2.5
AEGL 3	27	21	15	8.6	6.6

74-93-1 Methyl mercaptan (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	40	29	23	14	7.3
AEGL 3	120	86	68	43	22

NR = Not recommended due to insufficient data

Level of Distinct Odor Awareness (LOA)= 0.019 ppm

74-98-6 Propane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	10,000*	6,900*	5,500*	5,500*	5,500*
AEGL 2	**see below	**see below	**see below	**see below	**see below
AEGL 3	***see below	***see below	***see below	***see below	***see below

Lower Explosive Limit (LEL) = 23,000 ppm

* = $\geq 10\%$ LEL; ** = $\geq 50\%$ LEL; *** = $\geq 100\%$ LEL

AEGL 2 - 10 min/30 min/60 min/4 hr/8 hr = ** 17,000 ppm

AEGL 3 - 10 min/30 min/60 min/4 hr/8 hr = *** 33,000 ppm

For values denoted as * safety considerations against the hazard(s) of explosion(s) must be taken into account.

For values denoted as ** & *** extreme safety considerations against the hazard(s) of explosion(s) must be taken into account

75-01-4 Vinyl chloride (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	450	310	250	140	70
AEGL 2	2,800	1,600	1,200	820	820
AEGL 3	12,000*	6,800*	4,800*	3,400	3,400

Lower Explosion Limit (LEL) range = 38,000 ppm to 293,000 ppm; * = $\geq 10\%$ LEL

For values denoted as * safety considerations against the hazard(s) of explosion(s) must be taken into account.

75-05-8 Acetonitrile (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	13	13	13	13	NR
AEGL 2	80	80	50	21	14
AEGL 3	240	240	150	64	42

NR = Not recommended due to insufficient data

75-08-1 Ethyl mercaptan (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	1.0	1.0	1.0	1.0	1.0
AEGL 2	150	150	120	77	37
AEGL 3	450	450	360	230	110

Level of Distinct Odor Awareness (LOA)= 0.00014 ppm

75-15-0 Carbon disulfide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	17	17	13	8.4	6.7
AEGL 2	200	200	160	100	50
AEGL 3	600	600	480	300	150

75-21-8 Ethylene oxide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	80	80	45	14	7.9
AEGL 3	360	360	200	63	35

NR = Not recommended due to insufficient data

75-44-5 *Phosgene (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.60	0.60	0.30	0.080	0.040
AEGL 3	3.6	1.5	0.75	0.20	0.090

NR = Not recommended due to insufficient data

* Final AEGL values as published by NRC Vol 2 (2002). Phosgene was re-reviewed by the National Advisory Committee on Sept 9, 2009 (http://www.epa.gov/oppt/aegl/pubs/nac_49minutes_final.pdf) and changes have not been finalized by the National Academies. Thus, final AEGL values as published in NRC Vol 2 (2002) take precedence.

75-54-7 Methyl dichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.90	0.90	0.90	0.90	0.90
AEGL 2	50	22	11	5.5	5.5
AEGL 3	310	110	50	13	13

75-55-8 Propylenimine (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	83	25	12	2.5	1.2
AEGL 3	170	50	23	5.1	2.4

NR = Not recommended due to insufficient data

75-56-9 Propylene oxide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	73	73	73	73	73
AEGL 2	440	440	290	130	86
AEGL 3	1300	1300	870	390	260

Level of Distinct Odor Awareness = 21 ppm

75-77-4 Trimethyl chlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	1.8	1.8	1.8	1.8	1.8
AEGL 2	100	43	22	11	11
AEGL 3	620	210	100	26	26

75-78-5 Dimethyl dichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.90	0.90	0.90	0.90	0.90
AEGL 2	50	22	11	5.5	5.5
AEGL 3	310	110	50	13	13

75-79-6 Methyl trichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.60	0.60	0.60	0.60	0.60
AEGL 2	33	14	7.3	3.7	3.7
AEGL 3	210	70	33	8.7	8.7

75-86-5 Acetone cyanohydrin (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	2.5	2.5	2.0	1.3	1.0
AEGL 2	17	10	7.1	3.5	2.5
AEGL 3	27	21	15	8.6	6.6

75-94-5 Vinyl trichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.60	0.60	0.60	0.60	0.60
AEGL 2	33	14	7.3	3.7	3.7
AEGL 3	210	70	33	8.7	8.7

77-81-6 Agent GA (Tabun) (ppm) [mg/m³]

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.0010 [0.0069]	0.00060 [0.0040]	0.00042 [0.0028]	0.00021 [0.0014]	0.00015 [0.0010]
AEGL 2	0.013 [0.087]	0.0075 [0.050]	0.0053 [0.035]	0.0026 [0.017]	0.0020 [0.013]
AEGL 3	0.11 [0.76]	0.057 [0.38]	0.039 [0.26]	0.021 [0.14]	0.015 [0.10]

78-82-0 Isobutyronitrile (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	2.5	2.5	2.0	1.3	0.83
AEGL 3	7.6	7.6	6.1	3.8	2.5

NR = Not recommended due to insufficient data

78-85-3 Methacrylaldehyde (ppm) (May 01, 2015)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.20	0.20	0.20	0.20	0.20
AEGL 2	0.33	0.33	0.33	0.33	0.33
AEGL 3	4.3	4.3	3.5	2.2	1.4

78-93-3 Methyl ethyl ketone (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	200	200	200	200	200
AEGL 2	4,900*	3,400*	2,700*	1,700	1,700
AEGL 3	**see below	**see below	4,000*	2,500*	2,500*

Lower Explosive Limit (LEL) = 18,000 ppm

* = $\geq 10\%$ LEL; ** = $\geq 50\%$ LEL

AEGL 3 - 10 min/30 min = ** 10,000 ppm

For values denoted as * safety considerations against the hazard(s) of explosion(s) must be taken into account.

For values denoted as ** extreme safety considerations against the hazard(s) of explosion(s) must be taken into account

78-95-5 Chloroacetone (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	8.0	5.5	4.4	1.1	0.53
AEGL 3	24	17	13	3.3	1.6

NR = Not recommended due to insufficient data

79-11-8 Monochloroacetic acid (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	12	8.3	6.6	1.7	0.83
AEGL 3	NR	NR	NR	NR	NR

79-21-0 Peracetic Acid (mg/m³)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.52	0.52	0.52	0.52	0.52
AEGL 2	1.6	1.6	1.6	1.6	1.6
AEGL 3	60	30	15	6.3	4.1

79-22-1 Methyl chloroformate (ppm) (Sep 2016)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	4.0	2.8	2.2	1.4	0.70
AEGL 3	12	8.5	6.7	4.2	2.1

NR, not recommended. Absence of an AEGL-1 value does not imply that exposure below the AEGL-2 value is without adverse effects.

80-10-4 Diphenyl dichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.90	0.90	0.90	0.90	0.90
AEGL 2	50	22	11	5.5	5.5
AEGL 3	310	110	50	13	13

91-08-7 2,6-Toluenediisocyanate (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.020	0.020	0.020	0.010	0.010
AEGL 2	0.24	0.17	0.083	0.021	0.021
AEGL 3	0.65	0.65	0.51	0.32	0.16

95-63-6 1,2,4-Trimethylbenzene (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	180	180	140	90	45
AEGL 2	460	460	360	230	150
AEGL 3	NR	NR	NR	NR	NR

*NR = Not recommended due to lack of data

96-64-0 Agent GD (Soman) (ppm) [mg/m³]

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.00046 [0.0035]	0.00026 [0.0020]	0.00018 [0.0014]	0.000091 [0.00070]	0.000065 [0.00050]
AEGL 2	0.0057 [0.044]	0.0033 [0.025]	0.0022 [0.018]	0.0012 [0.0085]	0.00085 [0.0065]
AEGL 3	0.049 [0.38]	0.025 [0.19]	0.017 [0.13]	0.0091 [0.070]	0.0066 [0.051]

98-13-5 Trichlorophenylsilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.60	0.60	0.60	0.60	0.60
AEGL 2	33	14	7.3	3.7	3.7
AEGL 3	210	70	33	8.7	8.7

100-47-0 Benzonitrile (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	11	7.8	6.2	2.5	1.2
AEGL 3	34	24	19	7.4	3.7

NR = Not recommended due to insufficient data

103-71-9 Phenyl isocyanate (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.012	0.012	0.0096	0.0061	0.0030
AEGL 3	0.036	0.036	0.029	0.018	0.0091

106-89-8 Epichlorohydrin (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	1.7	1.7	1.7	1.7	1.7
AEGL 2	53	53	24	14	6.7
AEGL 3	570	160	72	44	20

106-97-8 Butane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	**see below	6,900*	5,500*	5,500*	5,500*
AEGL 2	***see below	**see below	**see below	**see below	**see below
AEGL 3	***see below	***see below	***see below	***see below	***see below

Lower Explosive Limit (LEL) = 19,000 ppm

* = $\geq 10\%$ LEL; ** = $\geq 50\%$ LEL; *** = $\geq 100\%$ LEL

AEGL 1 - 10 min = ** 10,000 ppm

AEGL 2 - 10 min = *** 24,000 ppm; 30 min/ 60 min/ 4hr/ 8hr = ** 17,000 ppm

AEGL 3 - 10 min = *** 77,000 ppm; 30 min/ 60 min/ 4hr/ 8hr = *** 53,000 ppm

For values denoted as * safety considerations against the hazard(s) of explosion(s) must be taken into account.

For values denoted as ** extreme safety considerations against the hazard(s) of explosion(s) must be taken into account

107-02-8 Acrolein (ppm)

	10 min	30 min	60 min	4 hr	8 hr
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AEGL 1	0.030	0.030	0.030	0.030	0.030
AEGL 2	0.44	0.18	0.10	0.10	0.10
AEGL 3	6.2	2.5	1.4	0.48	0.27

107-07-3 Ethylene chlorohydrin (2-Chloroethanol) (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	2.1	1.5	1.2	0.47	0.23
AEGL 3	6.4	4.4	3.5	1.4	0.7

NR = Not recommended due to insufficient data

107-11-9 Allyl Amine (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.42	0.42	0.42	0.42	0.42
AEGL 2	3.3	3.3	3.3	1.8	1.2
AEGL 3	150	40	18	3.5	2.3

107-12-0 Propionitrile (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	3.7	3.7	3.0	1.9	1.3
AEGL 3	11	11	9.1	5.7	3.8

NR = Not recommended due to insufficient data

107-13-1 Acrylonitrile (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	1.5	1.5	NR	NR	NR
AEGL 2	8.6	3.2	1.7	0.48	0.26
AEGL 3	130	50	28	9.7	5.2

NR = Not recommended due to insufficient data

107-14-2 Chloroacetonitrile (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	8.0	8.0	5.0	2.1	1.4
AEGL 3	24	24	15	6.4	4.2

NR = Not recommended due to insufficient data

107-15-3 Ethylene diamine (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	12	12	9.7	6.1	4.8
AEGL 3	25	25	20	13	10

NR = Not recommended due to insufficient data

107-18-6 Allyl alcohol (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.09	0.09	0.09	0.09	0.09
AEGL 2	11	3.5	1.7	0.73	0.33
AEGL 3	87	27	13	3.1	1.5

107-19-7 Propargyl alcohol (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	2.5	2.5	2.5	2.5	2.5
AEGL 2	20	20	16	10	6.6
AEGL 3	130	91	72	29	14

107-20-0 Chloroacetaldehyde (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	2.3	2.3	1.3	0.40	0.22
AEGL 2	9.8	3.9	2.2	0.69	0.39
AEGL 3	44	18	9.9	3.1	1.8

107-30-2 Chloromethyl methyl ether (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.60	0.60	0.47	0.30	0.22
AEGL 3	2.6	2.6	2.0	1.3	0.93

NR = Not recommended due to insufficient data

107-37-9 Allyl trichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.60	0.60	0.60	0.60	0.60
AEGL 2	33	14	7.3	3.7	3.7
AEGL 3	210	70	33	8.7	8.7

107-44-8 Agent GB (Sarin) (ppm) [mg/m³]

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.0012 [0.0069]	0.00068 [0.0040]	0.00048 [0.0028]	0.00024 [0.0014]	0.00017 [0.0010]
AEGL 2	0.015 [0.087]	0.0085 [0.050]	0.0060 [0.035]	0.0029 [0.017]	0.0022 [0.013]
AEGL 3	0.064 [0.38]	0.032 [0.19]	0.022 [0.13]	0.012 [0.070]	0.0087 [0.051]

107-72-2 Amyl trichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.60	0.60	0.60	0.60	0.60
AEGL 2	33	14	7.3	3.7	3.7
AEGL 3	210	70	33	8.7	8.7

108-05-4 Vinyl acetate (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	6.7	6.7	6.7	6.7	6.7
AEGL 2	46	46	36	23	15
AEGL 3	230	230	180	110	75

Level of Distinct Odor Awareness (LOA) = 0.25 ppm

108-23-6 Isopropyl chloroformate (ppm) (Sep 2016)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	6.0	4.3	3.3	0.83	0.43
AEGL 3	18	13	10	2.5	1.3

NR, not recommended. Absence of an AEGL-1 value does not imply that exposure below the AEGL-2 value is without adverse effects.

108-67-8 1,3,5-Trimethylbenzene (Mesitylene) (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	180	180	140	90	45
AEGL 2	460	460	360	230	150
AEGL 3	NR	NR	NR	NR	NR

*NR = Not recommended due to lack of data

108-88-3 Toluene (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	67	67	67	67	67
AEGL 2	1,400*	760	560	310	250
AEGL 3	** 10,000	5,200*	3,700*	1,800*	1,400*

Lower Explosive Limit (LEL) = 14,000 ppm

* = $\geq 10\%$ LEL; ** = $\geq 50\%$ LEL

For values denoted as * safety considerations against the hazard(s) of explosion(s) must be taken into account.

For values denoted as ** extreme safety considerations against the hazard(s) of explosion(s) must be taken into account

108-90-7 Chlorobenzene (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	10	10	10	10	10
AEGL 2	430	300	150	150	150
AEGL 3	1100	800	400	400	400

108-91-8 Cyclohexylamine (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	1.8	1.8	1.8	1.8	1.8

AEGL 2	11	11	8.6	5.4	2.7
AEGL 3	38	38	30	19	9.5

108-95-2 Phenol (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	19	19	15	9.5	6.3
AEGL 2	29	29	23	15	12
AEGL 3	NR	NR	NR	NR	NR

NR = Not recommended due to insufficient data

Level of Distinct Odor Awareness (LOA) = 0.25 ppm

108-98-5 Phenyl mercaptan (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	1.0	0.70	0.53	0.33	0.17
AEGL 3	3.0	2.1	1.6	1.0	0.52

*NR = Not recommended due to lack of data

109-61-5 Propyl chloroformate (ppm) (Sep 2016)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	6.7	4.7	3.7	0.90	0.47
AEGL 3	20	14	11	2.7	1.4

NR, not recommended. Absence of an AEGL-1 value does not imply that exposure below the AEGL-2 value is without adverse effects.

109-77-3 Malononitrile (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	1.2	1.2	0.77	0.32	0.22
AEGL 3	3.7	3.7	2.3	0.98	0.65

NR = Not recommended due to insufficient data

109-90-0 Ethyl isocyanate (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.20	0.065	0.034	0.0085	0.0040
AEGL 3	0.60	0.20	0.10	0.025	0.013

NR = Not recommended due to insufficient data

110-00-9 Furan (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	12	8.5	6.8	1.7	0.85
AEGL 3	35	24	19	4.8	2.4

NR = Not recommended due to insufficient data

110-54-3 Hexane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	*4,000	*2,900	*2,900	*2,900	*2,900
AEGL 3	**see below	***see below	***see below	***see below	***see below

NR = Not recommended due to insufficient data

Lower Explosive Limit (LEL) = 11,000 ppm

* The AEGL-2 values is higher than 10% of the lower explosive limit of n-hexane in air. Therefore, safely considerations against the hazard of explosion must be taken into account.

** The 10-min AEGL-3 value of 12,000 ppm (42,000 mg/m³) is higher than the lower explosive limit of n-hexane in air. Therefore, extreme safety considerations against the hazard of explosion must be taken into account.

*** The AEGL-3 values for the 30-min, 1-hr, 4-hr and 8-hr durations are each 8,600 ppm (30,000 mg/m³) which is higher than 50% of the lower explosive limit of n-hexane in air. Therefore, extreme safety considerations against the hazard of explosion must be taken into account.

110-89-4 Piperidine (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	10	10	6.6	2.6	1.7
AEGL 2	50	50	33	13	8.3
AEGL 3	370	180	110	45	28

Level of Distinct Odor Awareness (LOA) = 5.8 ppm

111-36-4 n-Butyl isocyanate (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.10	0.10	0.083	0.053	0.026
AEGL 3	0.31	0.31	0.25	0.16	0.078

112-04-9 Octadecyl trichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.60	0.60	0.60	0.60	0.60
AEGL 2	33	14	7.3	3.7	3.7
AEGL 3	210	70	33	8.7	8.7

115-21-9 Ethyl trichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.60	0.60	0.60	0.60	0.60
AEGL 2	33	14	7.3	3.7	3.7
AEGL 3	210	70	33	8.7	8.7

116-14-3 Tetrafluoroethylene (ppm) (May 01, 2015)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	27	27	22	14	9.0
AEGL 2	69	69	55	34	23
AEGL 3	420	420	330	210	100

123-73-9 trans-Crotonaldehyde (ppm)

	10 min	30 min	60 min	4 hr	8 hr
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AEGL 1	0.19	0.19	0.19	0.19	0.19
AEGL 2	27	8.9	4.4	1.1	0.56
AEGL 3	44	27	14	2.6	1.5

124-63-0 Methanesulfonyl chloride (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.40	0.40	0.21	0.053	0.026
AEGL 3	1.2	1.2	0.62	0.16	0.078

NR = Not recommended due to insufficient data

124-70-9 Methylvinyl dichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.90	0.90	0.90	0.90	0.90
AEGL 2	50	22	11	5.5	5.5
AEGL 3	310	110	50	13	13

126-98-7 Methacrylonitrile (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	1.3	1.3	1.0	0.67	0.33
AEGL 3	3.9	3.9	3.1	2.0	0.99

NR = Not recommended due to insufficient data

141-57-1 Propyl trichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.60	0.60	0.60	0.60	0.60
AEGL 2	33	14	7.3	3.7	3.7
AEGL 3	210	70	33	8.7	8.7

141-59-3 t-Octyl mercaptan (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR

AEGL 2	0.77	0.77	0.60	0.40	0.19
AEGL 3	2.3	2.3	1.8	1.2	0.58

NR = Not recommended due to insufficient data

143-33-9 Sodium cyanide (mg/m³) 04/01/2015

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	5.0	5.0	4.0	2.6	2.0
AEGL 2	34	20	14	7.0	5.0
AEGL 3	54	42	30	17	13

151-50-8 Potassium cyanide (mg/m³) 04/01/2015

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	6.6	6.6	5.3	3.5	2.7
AEGL 2	45	27	19	9.3	6.6
AEGL 3	72	56	40	23	18

151-56-4 Ethylenimine (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	33	9.8	4.6	1.0	0.47
AEGL 3	51	19	9.9	2.8	1.5

NR = Not recommended due to insufficient data

Level of Distinct Odor Awareness = 10.9 ppm

156-59-2 cis-1,2-Dichloroethylene (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	140	140	140	140	140
AEGL 2	500	500	500	340	230
AEGL 3	850	850	850	620	310

156-60-5 cis- and trans-1,2-Dichloroethylene (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	280	280	280	280	280
AEGL 2	1,000	1,000	1,000	690	450
AEGL 3	1,700	1,700	1,700	1,200	620

302-01-2 Hydrazine (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.10	0.10	0.10	0.10	0.10
AEGL 2	23	16	13	3.1	1.6
AEGL 3	64	45	35	8.9	4.4

329-99-7 GF Agent (ppm) [mg/m³]

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.00049 [0.0035]	0.00028 [0.0020]	0.00020 [0.0014]	0.00010 [0.00070]	0.000070 [0.00050]
AEGL 2	0.0062 [0.044]	0.0035 [0.025]	0.0024 [0.018]	0.0013 [0.0085]	0.00091 [0.0065]
AEGL 3	0.053 [0.38]	0.027 [0.19]	0.018 [0.13]	0.0098 [0.070]	0.0071 [0.051]

353-50-4 Carbonyl fluoride (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.35	0.35	0.28	0.17	0.087
AEGL 3	1.0	1.0	0.83	0.52	0.26

NR = Not recommended due to insufficient data

460-19-5 Cyanogen (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	2.5	2.5	2.0	1.3	1.0
AEGL 2	50	17	8.3	4.3	4.3
AEGL 3	150	50	25	13	13

463-51-4 Ketene (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.080	0.080	0.063	0.040	0.029
AEGL 3	0.24	0.24	0.19	0.12	0.088

NR = Not recommended due to insufficient data

501-53-1 Benzyl chloroformate (ppm) (Sep 2016)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	1.2	1.2	0.97	0.63	0.31
AEGL 3	3.7	3.7	2.9	1.9	0.93

NR, not recommended. Absence of an AEGL-1 value does not imply that exposure below the AEGL-2 value is without adverse effects.

505-60-2 Sulfur Mustard (ppm)[mg/m³]

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.060 [0.40]	0.020 [0.13]	0.010 [0.067]	0.0030 [0.017]	0.0010 [0.0083]
AEGL 2	0.090 [0.60]	0.030 [0.20]	0.020 [0.10]	0.0040 [0.025]	0.0020 [0.013]
AEGL 3	0.59 [3.9]	0.41 [2.7]	0.32 [2.1]	0.080 [0.53]	0.040 [0.27]

509-14-8 Tetranitromethane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.66	0.66	0.52	0.33	0.17
AEGL 3	2.2	2.2	1.7	1.1	0.55

NR = Not recommended due to insufficient data

526-73-8 1,2,3-Trimethylbenzene (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	180	180	140	90	45
AEGL 2	460	460	360	230	150
AEGL 3	NR	NR	NR	NR	NR

*NR = Not recommended due to lack of data

540-73-8 1,2-Dimethyl hydrazine (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	18	6.0	3.0	0.75	0.38
AEGL 3	65	22	11	2.7	1.4

NR = Not recommended due to insufficient data

541-25-3 Lewisite 1 (mg/m³) (including mixtures with Lewisite 2 CAS #40334-69-8 and Lewisite 3 CAS #40334-70-1)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	1.3	0.47	0.25	0.070	0.037
AEGL 3	3.9	1.4	0.74	0.21	0.11

NR = Not recommended due to insufficient data

541-41-3 Ethyl chloroformate (ppm) (Sep 2016)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	2.9	2.0	1.6	0.40	0.20
AEGL 3	8.8	6.1	4.8	1.2	0.60

NR, not recommended. Absence of an AEGL-1 value does not imply that exposure below the AEGL-2 value is without adverse effects.

542-88-1 Bis-chloromethyl ether (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.055	0.055	0.044	0.028	0.020
AEGL 3	0.23	0.23	0.18	0.11	0.075

NR = Not recommended due to insufficient data

543-27-1 Isobutyl chloroformate (ppm) (Sep 2016)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	4.0	2.8	2.2	0.57	0.28
AEGL 3	12	8.4	6.7	1.7	0.83

NR, not recommended. Absence of an AEGL-1 value does not imply that exposure below the AEGL-2 value is without adverse effects.

556-61-6 Methyl isothiocyanate (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.27	0.27	0.27	0.27	0.27
AEGL 2	21	21	17	10	5.3
AEGL 3	63	63	50	31	16

584-84-9 2,4-Toluene Diisocyanate (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.020	0.020	0.020	0.010	0.010
AEGL 2	0.24	0.17	0.083	0.021	0.021
AEGL 3	0.65	0.65	0.51	0.32	0.16

592-01-8 Calcium cyanide (mg/m³) 04/01/2015

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	4.7	4.7	3.8	2.4	1.9
AEGL 2	32	19	13	6.6	4.7
AEGL 3	51	39	28	16	12

592-34-7 n-Butyl chloroformate (ppm) (Sep 2016)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	4.0	2.8	2.2	0.57	0.28
AEGL 3	12	8.4	6.7	1.7	0.83

NR, not recommended. Absence of an AEGL-1 value does not imply that exposure below the AEGL-2 value is without adverse effects.

594-42-3 Perchloromethyl mercaptan (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.013	0.013	0.013	0.013	0.013
AEGL 2	0.53	0.37	0.30	0.077	0.037
AEGL 3	1.6	1.1	0.90	0.23	0.11

Level of Distinct Odor Awareness = 0.016 ppm

598-31-2 Bromoacetone (ppm) 9/21/09

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.011	0.011	0.011	0.011	0.011
AEGL 2	1.4	0.57	0.33	0.11	0.063
AEGL 3	4.1	1.7	0.98	0.32	0.19

624-83-9 Methyl isocyanate (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.40	0.13	0.067	0.017	0.0080
AEGL 3	1.2	0.40	0.20	0.05	0.025

NR = Not recommended since AEGL-1 irritation levels would exceed AEGL-2

630-08-0 Carbon monoxide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	420	150	83	33	27
AEGL 3	1,700	600	330	150	130

NR = Not recommended due to insufficient data

674-82-8 Diketene (ppm) (May 01, 2015)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	1.8	1.3	1.0	0.25	0.13
AEGL 3	5.5	3.8	3.0	0.75	0.38

NR = Not recommended due to insufficient data

681-84-5 Tetramethoxy silane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	1.1	1.1	0.91	0.57	0.38
AEGL 3	1.7	1.7	1.4	0.87	0.43

NR = Not recommended due to insufficient data

684-16-2 Hexafluoroacetone (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.40	0.40	0.20	0.050	0.025
AEGL 3	160	160	80	20	10

NR = Not recommended due to insufficient data

811-97-2 HFC 134A (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	8,000	8,000	8,000	8,000	8,000
AEGL 2	13,000	13,000	13,000	13,000	13,000
AEGL 3	27,000	27,000	27,000	27,000	27,000

928-65-4 Hexyltrichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.60	0.60	0.60	0.60	0.60
AEGL 2	33	14	7.3	3.7	3.7
AEGL 3	210	70	33	8.7	8.7

993-00-0 Methyl chlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	1.8	1.8	1.8	1.8	1.8
AEGL 2	100	43	22	11	11
AEGL 3	620	210	100	26	26

1066-35-9 Dimethyl chlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	1.8	1.8	1.8	1.8	1.8
AEGL 2	100	43	22	11	11
AEGL 3	620	210	100	26	26

1305-99-3 Calcium phosphide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	2.0	2.0	1.0	0.25	0.13
AEGL 3	3.6	3.6	1.8	0.45	0.23

NR = Not recommended due to insufficient data

1314-84-7 Zinc phosphide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	2.0	2.0	1.0	0.25	0.13
AEGL 3	3.6	3.6	1.8	0.45	0.23

NR = Not recommended due to insufficient data

1330-20-7 Xylenes (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	130	130	130	130	130
AEGL 2	2,500*	1,300*	920*	500	400
AEGL 3	** see below	3,600*	2,500*	1,300*	1,000*

Lower Explosion Limit (LEL) = 9,000 ppm

* $\geq 10\%$ LEL; ** $\geq 50\%$ LEL

AEGL 3 - 10 min = ** 7,200 ppm

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For value denoted as ** extreme safety considerations against the hazard(s) of explosion(s) must be taken into account

1498-51-7 Ethylphosphorodichloridate (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.37	0.25	0.20	0.13	0.063
AEGL 3	1.1	0.76	0.60	0.38	0.19

1558-25-4 Chloromethyl trichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.60	0.60	0.60	0.60	0.60
AEGL 2	33	14	7.3	3.7	3.7
AEGL 3	210	70	33	8.7	8.7

1717-00-6 HCFC 141b (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	1,000	1,000	1,000	1,000	1,000
AEGL 2	1,700	1,700	1,700	1,700	1,700
AEGL 3	3,000	3,000	3,000	3,000	3,000

1719-53-5 Diethyl dichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.90	0.90	0.90	0.90	0.90
AEGL 2	50	22	11	5.5	5.5
AEGL 3	310	110	50	13	13

1885-14-9 Phenyl chloroformate (ppm) (Sep 2016)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.24	0.24	0.19	0.12	0.060
AEGL 3	0.72	0.72	0.57	0.36	0.18

NR, not recommended. Absence of an AEGL-1 value does not imply that exposure below the AEGL-2 value is without adverse effects.

2487-90-3 Trimethoxysilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	2.9	1.4	0.83	0.33	0.20
AEGL 3	8.8	4.1	2.5	0.98	0.61

NR = Not recommended due to insufficient data

2698-41-1 Tear Gas (mg/m³)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.083	0.083	0.083	0.083	0.083
AEGL 3	140	29	11	1.5	1.5

NR = Not recommended due to insufficient data

2937-50-0 Allyl chloroformate (ppm) (Sep 2016)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	1.3	0.87	0.70	0.18	0.090
AEGL 3	3.8	2.6	2.1	0.53	0.26

NR, not recommended. Absence of an AEGL-1 value does not imply that exposure below the AEGL-2 value is without adverse effects.

2941-64-2 Ethylchlorothioformate (ppm) (Sep 2016)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.33	0.33	0.26	0.17	0.083
AEGL 3	1.0	1.0	0.79	0.50	0.25

NR, not recommended. Absence of an AEGL-1 value does not imply that exposure below the AEGL-2 value is without adverse effects.

3173-53-3 Cyclohexyl isocyanate (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.20	0.065	0.034	0.0085	0.0040
AEGL 3	0.60	0.20	0.10	0.025	0.013

NR = Not recommended due to insufficient data

3282-30-2 Trimethylacetyl chloride (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.20	0.20	0.16	0.10	0.07
AEGL 3	0.60	0.60	0.47	0.30	0.20

NR = Not recommended due to insufficient data

4109-96-0 Dichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.90	0.90	0.90	0.90	0.90
AEGL 2	50	22	11	5.5	5.5
AEGL 3	310	110	50	13	13

4170-30-3 cis-Crotonaldehyde (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.19	0.19	0.19	0.19	0.19
AEGL 2	27	8.9	4.4	1.1	0.56
AEGL 3	44	27	14	2.6	1.5

4484-72-4 Dodecyl trichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.60	0.60	0.60	0.60	0.60
AEGL 2	33	14	7.3	3.7	3.7
AEGL 3	210	70	33	8.7	8.7

5283-66-9 Octyl trichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.60	0.60	0.60	0.60	0.60
AEGL 2	33	14	7.3	3.7	3.7
AEGL 3	210	70	33	8.7	8.7

5283-67-0 Nonyl trichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.60	0.60	0.60	0.60	0.60
AEGL 2	33	14	7.3	3.7	3.7
AEGL 3	210	70	33	8.7	8.7

6423-43-4 Propylene Glycol Dinitrate (main component of Otto Fuel 106602-80-6) (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.33	0.33	0.17	0.050	0.030
AEGL 2	2.0	2.0	1.0	0.25	0.13
AEGL 3	16	16	13	8.0	5.3

6581-06-2 BZ (mg/m³)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.067	0.022	0.011	NR	NR
AEGL 3	1.2	0.41	0.21	NR	NR

7446-09-5 Sulfur Dioxide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.20	0.20	0.20	0.20	0.20
AEGL 2	0.75	0.75	0.75	0.75	0.75
AEGL 3	30	30	30	19	9.6

7521-80-4 Butyl trichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.60	0.60	0.60	0.60	0.60
AEGL 2	33	14	7.3	3.7	3.7
AEGL 3	210	70	33	8.7	8.7

7616-94-6 Perchloryl fluoride (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	1.8	1.8	1.5	0.92	0.60
AEGL 2	5.0	5.0	4.0	2.5	1.2
AEGL 3	15	15	12	7.5	3.7

7637-07-2 Boron trifluoride (mg/m³)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	2.5	2.5	2.5	2.5	2.5
AEGL 2	37	37	29	18	9.3
AEGL 3	110	110	88	55	28

7647-01-0 Hydrogen chloride (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	1.8	1.8	1.8	1.8	1.8
AEGL 2	100	43	22	11	11
AEGL 3	620	210	100	26	26

7664-39-3 Hydrogen fluoride (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	1.0	1.0	1.0	1.0	1.0
AEGL 2	95	34	24	12	12
AEGL 3	170	62	44	22	22

7664-41-7 Ammonia (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	30	30	30	30	30
AEGL 2	220	220	160	110	110
AEGL 3	2,700	1,600	1,100	550	390

7697-37-2 Nitric Acid (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.16	0.16	0.16	0.16	0.16
AEGL 2	43	30	24	6.0	3.0
AEGL 3	170	120	92	23	11

7719-12-2 Phosphorus Trichloride (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.34	0.34	0.34	0.34	0.34
AEGL 2	2.5	2.5	2.0	1.3	0.83
AEGL 3	7.0	7.0	5.6	3.5	1.8

7726-95-6 Bromine (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.033	0.033	0.033	0.033	0.033
AEGL 2	0.55	0.33	0.24	0.13	0.095
AEGL 3	19	12	8.5	4.5	3.3

7782-41-4 Fluorine (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	1.7	1.7	1.7	1.7	1.7
AEGL 2	20	11	5.0	2.3	2.3
AEGL 3	36	19	13	5.7	5.7

7782-50-5 Chlorine (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.50	0.50	0.50	0.50	0.50
AEGL 2	2.8	2.8	2.0	1.0	0.71
AEGL 3	50	28	20	10	7.1

7783-06-4 Hydrogen sulfide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.75	0.60	0.51	0.36	0.33
AEGL 2	41	32	27	20	17
AEGL 3	76	59	50	37	31

Level of Distinct Odor Awareness = 0.01 ppm

7783-07-5 Hydrogen selenide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.22	0.15	0.11	0.064	0.048
AEGL 3	0.67	0.44	0.33	0.19	0.14

NR = Not recommended due to insufficient data

7783-41-7 Oxygen difluoride (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.43	0.16	0.083	0.024	0.013
AEGL 3	1.3	0.47	0.25	0.071	0.038

NR = Not recommended due to insufficient data

7783-80-4 Tellurium hexafluoride (ppm) 04/01/2015

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.0097	0.0067	0.0053	0.0033	0.0017
AEGL 3	0.029	0.020	0.016	0.010	0.0050

NR = Not recommended due to insufficient data

7783-81-5 Uranium hexafluoride (mg/m³)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	3.6	3.6	3.6	NR	NR
AEGL 2	28	19	9.6	2.4	1.2
AEGL 3	216	72	36	9.0	4.5

7784-42-1 Arsenic (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.30	0.21	0.17	0.040	0.020
AEGL 3	0.91	0.63	0.50	0.13	0.060

NR = Not recommended since AEGL-2 concentrations are below sensory effect concentrations.

7787-71-5 Bromine trifluoride (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.12	0.12	0.12	0.12	0.12
AEGL 2	8.1	3.5	2.0	0.70	0.41
AEGL 3	84	36	21	7.3	7.3

7789-30-2 Bromine pentafluoride (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.70	0.39	0.17	0.082	0.057
AEGL 3	79	55	33	8.3	4.2

NR = Not recommended due to insufficient data

7790-91-2 Chlorine trifluoride (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.12	0.12	0.12	0.12	0.12
AEGL 2	8.1	3.5	2.0	0.70	0.41
AEGL 3	84	36	21	7.3	7.3

7791-25-5 Sulfuryl chloride (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	4.7	4.7	3.7	2.3	1.2
AEGL 3	14	14	11	7.0	3.5

NR = Not recommended due to insufficient data

7803-51-2 Phosphine (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	4.0	4.0	2.0	0.50	0.25
AEGL 3	7.2	7.2	3.6	0.90	0.45

NR = Not recommended due to insufficient data

10025-78-2 Trichlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.60	0.60	0.60	0.60	0.60
AEGL 2	33	14	7.3	3.7	3.7
AEGL 3	210	70	33	8.7	8.7

10025-87-3 Phosphorus oxychloride (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	NR	NR	NR	NR	NR
AEGL 3	1.1	1.1	0.85	0.54	0.27

NR = Not recommended due to insufficient data

10026-04-7 Tetrachlorosilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.45	0.45	0.45	0.45	0.45
AEGL 2	25	11	5.5	2.8	2.8
AEGL 3	160	53	25	6.5	6.5

10035-10-6 Hydrogen Bromide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	1.0	1.0	1.0	1.0	1.0
AEGL 2	250	83	40	10	5.0
AEGL 3	740	250	120	31	15

10049-04-4 Chlorine dioxide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.15	0.15	0.15	0.15	0.15
AEGL 2	1.4	1.4	1.1	0.69	0.45
AEGL 3	3.0	3.0	2.4	1.5	0.98

10102-43-9 * Nitric oxide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	NR	NR	NR	NR	NR
AEGL 3	NR	NR	NR	NR	NR

NR = Not recommended; AEGL values for nitrogen dioxide should be used for emergency planning; Short-term exposures below 80 ppm NO should not constitute a health hazard

10102-44-0 * Nitrogen dioxide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.50	0.50	0.50	0.50	0.50
AEGL 2	20	15	12	8.2	6.7
AEGL 3	34	25	20	14	11

* Some effects may be delayed

10294-33-4 Boron tribromide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.33	0.33	0.33	0.33	0.33
AEGL 2	83	28	13	3.3	1.7
AEGL 3	250	83	40	10	5.0

10544-72-6 Nitrogen Tetroxide ppm (mg/m³)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.25 (0.94)	0.25 (0.94)	0.25 (0.94)	0.25 (0.94)	0.25 (0.94)
AEGL 2	10 (38)	7.6 (28)	6.2 (23)	4.1 (15)	3.5 (13)
AEGL 3	17 (64)	13 (47)	10 (38)	7.0 (26)	5.7 (21)

12057-74-8 Magnesium phosphide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	2.0	2.0	1.0	0.25	0.13
AEGL 3	3.6	3.6	1.8	0.45	0.23

NR = Not recommended due to insufficient data

12058-85-4 Sodium phosphide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	4.0	4.0	2.0	0.50	0.25
AEGL 3	7.2	7.2	3.6	0.90	0.45

NR = Not recommended due to insufficient data

12504-13-1 Strontium phosphide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	2.0	2.0	1.0	0.25	0.13
AEGL 3	3.6	3.6	1.8	0.45	0.23

NR = Not recommended due to insufficient data

13463-39-3 Nickel carbonyl (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.10	0.072	0.036	0.0090	0.0045
AEGL 3	0.46	0.32	0.16	0.040	0.020

NR = Not recommended due to insufficient data

13463-40-6 Iron pentacarbonyl (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.077	0.077	0.060	0.037	0.025
AEGL 3	0.23	0.23	0.18	0.11	0.075

NR = Not recommended due to lack of data

13637-63-3 Chlorine pentafluoride (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.70	0.39	0.17	0.082	0.057
AEGL 3	21	12	8.0	3.9	2.7

NR = Not Recommended due to inadequate data

13863-41-7 Bromine chloride (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	1.1	1.1	0.83	0.53	0.37
AEGL 3	3.2	3.2	2.5	1.6	1.1

NR = Not recommended due to insufficient data

17462-58-7 sec-Butyl chloroformate (ppm) (Sep 2016)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	4.0	2.8	2.2	0.57	0.28
AEGL 3	12	8.4	6.7	1.7	0.83

NR, not recommended. Absence of an AEGL-1 value does not imply that exposure below the AEGL-2 value is without adverse effects.

19287-45-7 Diborane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	2.0	2.0	1.0	0.25	0.13
AEGL 3	7.3	7.3	3.7	0.92	0.46

NR = Not recommended due to insufficient data

19624-22-7 Pentaborane (ppm) (May 01, 2015)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.56	0.24	0.14	0.048	0.028
AEGL 3	2.0	0.87	0.51	0.17	0.10

NR = Not recommended due to insufficient data

20770-41-6 Potassium phosphide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	4.0	4.0	2.0	0.50	0.25
AEGL 3	7.2	7.2	3.6	0.90	0.45

NR = Not recommended due to insufficient data

20859-73-8 Aluminum phosphide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	4.0	4.0	2.0	0.50	0.25

AEGL 3	7.2	7.2	3.6	0.90	0.45
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NR = Not recommended due to insufficient data

24468-13-1 2-Ethylhexylchloroformate (ppm) (Sep 2016)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	1.2	1.2	0.97	0.60	0.30
AEGL 3	3.6	3.6	2.9	1.8	0.91

NR, not recommended. Absence of an AEGL-1 value does not imply that exposure below the AEGL-2 value is without adverse effects.

27137-85-5 Trichlorophenylsilane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.60	0.60	0.60	0.60	0.60
AEGL 2	33	14	7.3	3.7	3.7
AEGL 3	210	70	33	8.7	8.7

50782-69-9 Agent VX (ppm)[mg/m³]

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.000052 [0.00057]	0.000030 [0.00033]	0.000016 [0.00017]	0.0000091 [0.00010]	0.0000065 [0.000071]
AEGL 2	0.00065 [0.0072]	0.00038 [0.0042]	0.00027 [0.0029]	0.00014 [0.0015]	0.000095 [0.0010]
AEGL 3	0.0027 [0.029]	0.0014 [0.015]	0.00091 [0.010]	0.00048 [0.0052]	0.00035 [0.0038]

70892-10-3 and 8008-20-6 Jet Fuels (JP-5 and JP-8) (mg/m³)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	290	290	290	290	290
AEGL 2	1,100	1,100	1,100	1,100	1,100
AEGL 3	NR	NR	NR	NR	NR

NR = Not recommended due to insufficient data

163702-07-6 and 163702-08-7 (HFE-7100) Methyl nonafluorobutyl ether (40%) and Methyl nonafluoroisobutyl ether (60%) (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	2,500	2,500	2,500	2,500	2,500
AEGL 2	8,200	8,200	8,200	8,200	8,200
AEGL 3	15,000	15,000	15,000	15,000	15,000

Interim AEGLs (72)

Interim AEGLs are established following review and consideration of public comments by the National Advisory Committee for AEGLs (NAC/AEGL) of public comments on Proposed AEGLs that are published in the Federal Register. Interim AEGLs are available for use by organizations while awaiting NRC/NAS peer review and publication of Final AEGLs. (Dates) in parentheses refer to date of the NAC meeting when the decision was made to raise Proposed AEGLs to Interim status.

50-00-0 Formaldehyde (ppm) 12/12/06

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.90	0.90	0.90	0.90	0.90
AEGL 2	14	14	14	14	14
AEGL 3	100	70	56	35	35

51-75-2 Nitrogen Mustard-2 (mg/m³) 10/19/2007

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.13	0.044	0.022	0.0056	0.0028
AEGL 3	2.2	0.74	0.37	0.093	0.047

NR = Not recommended due to insufficient data

56-38-2 Parathion (mg/m³) 9/21/09

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	2.8	1.9	1.5	0.96	0.48
AEGL 3	3.6	2.5	2.0	1.3	0.63

NR = Not recommended due to insufficient data

67-56-1 Methanol (ppm) 4/20/04

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	670	670	530	340	270
AEGL 2	11,000*	4,000	2,100	730	520
AEGL 3	** See below	14,000*	7,200*	2,400	1,600

Lower Explosive Limit (LEL) = 55,000 ppm

* = $\geq 10\%$ LEL; ** = $\geq 50\%$ LEL

AEGL 3 - 10 min = ** 40,000 ppm

For values denoted as * safety considerations against the hazard(s) of explosion(s) must be taken into account.

For values denoted as ** extreme safety considerations against the hazard(s) of explosion(s) must be taken into account

Level of Distinct Odor Awareness (LOA) = 8.9 ppm

67-64-1 Acetone (ppm) 4/14/05

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	200	200	200	200	200
AEGL 2	9,300*	4,900*	3,200*	1,400	950
AEGL 3	**see below	8,600*	5,700*	2,500	1,700

Lower Explosive Limit (LEL) = 26,000 ppm

* = $\geq 10\%$ LEL; ** = $\geq 50\%$ LEL

AEGL 3 - 10 min = ** 16,000 ppm

For values denoted as * safety considerations against the hazard(s) of explosion(s) must be taken into account.

For values denoted as ** extreme safety considerations against the hazard(s) of explosion(s) must be taken into account

Level of Distinct Odor Awareness (LOA) = 160 ppm

71-43-2 Benzene (ppm) 10/19/2007

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	130	73	52	18	9.0
AEGL 2	2,000*	1,100	800	400	200
AEGL 3	**see below	5,600*	4,000*	2,000*	990

Lower Explosive Limit (LEL) = 14,000 ppm

* = $\geq 10\%$ LEL; ** = $\geq 50\%$ LEL

AEGL 3 - 10 min = ** 9,700 ppm

For values denoted as * safety considerations against the hazard(s) of explosion(s) must be taken into account.

For values denoted as ** extreme safety considerations against the hazard(s) of explosion(s) must be taken into account

71-55-6 1,1,1-Trichloroethane (ppm) 4/26/00

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	230	230	230	230	230
AEGL 2	930	670	600	380	310
AEGL 3	4,200	4,200	4,200	2,700	2,100

74-89-5 Methyl amine (ppm) (May 16, 2008)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	15	15	15	15	15
AEGL 2	160	92	64	31	21
AEGL 3	910	510	350	170	110

Level of Distinct Odor Awareness = 0.56 ppm

75-04-7 Ethylamine (ppm) (May 16, 2008)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	7.5	7.5	7.5	7.5	7.5
AEGL 2	150	76	49	22	14
AEGL 3	810	420	270	120	76

Level of Distinct Odor Awareness = 0.74 ppm

75-07-0 Acetaldehyde (ppm) 11/13/06

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	45	45	45	45	45
AEGL 2	340	340	270	170	110
AEGL 3	1100	1100	840	530	260

Level of Distinct Odor Awareness (LOA)= 0.56 ppm

75-09-2 Methylene chloride (ppm) 11/13/06

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	290	230	200	NR	NR
AEGL 2	1700	1200	560	100	60
AEGL 3	12,000	8,500	6,900	4,900	2,100

75-50-3 Trimethyl amine (ppm) (May 16, 2008)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	8.0	8.0	8.0	8.0	8.0
AEGL 2	240	150	120	67	51
AEGL 3	750	490	380	220	170

Level of Distinct Odor Awareness = 0.00051 ppm

76-06-2 Chloropicrin (ppm) (May 16, 2008)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.050	0.050	0.050	0.050	0.050
AEGL 2	0.15	0.15	0.15	0.15	0.15
AEGL 3	2.0	2.0	1.4	0.79	0.58

77-78-1 Dimethyl sulfate (ppm) 11/13/06

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.035	0.035	0.024	0.012	0.0087
AEGL 2	0.17	0.17	0.12	0.061	0.043
AEGL 3	4.0	2.3	1.6	0.82	0.58

78-94-4 Methyl vinyl ketone (ppm) (May 16, 2008)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.17	0.17	0.17	0.17	0.17
AEGL 2	1.5	1.5	1.2	0.76	0.50
AEGL 3	3.1	3.1	2.4	1.5	1.0

79-01-6 Trichloroethylene (ppm) 12/13/04

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	260	180	130	84	77
AEGL 2	960	620	450	270	240
AEGL 3	6,100	6,100	3,800	1,500	970

79-04-9 Chloroacetyl chloride (ppm) 11/13/06

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.040	0.040	0.040	0.040	0.040
AEGL 2	2.9	2.0	1.6	0.40	0.20
AEGL 3	95	66	52	13	6.5

79-10-7 Acrylic acid (ppm) 12/10/03

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	1.5	1.5	1.5	1.5	1.5
AEGL 2	68	68	46	21	14
AEGL 3	480	260	180	85	58

NR = Not recommended due to insufficient data

79-36-7 Dichloroacetyl Chloride (ppm) 11/13/06

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.040	0.040	0.040	0.040	0.040
AEGL 2	2.9	2.0	1.6	0.40	0.20
AEGL 3	95	66	52	13	6.5

79-38-9 Trifluorochloroethylene (ppm) (May 16, 2008)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	29	20	16	10	10
AEGL 2	160	110	86	54	54
AEGL 3	1500	690	420	150	91

79-41-4 Methacrylic acid (ppm) 12/12/06

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	6.7	6.7	6.7	6.7	6.7
AEGL 2	76	76	61	38	25
AEGL 3	280	280	220	140	71

80-62-6 Methyl methacrylate (ppm) 12/12/06

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	17	17	17	17	17
AEGL 2	150	150	120	76	50
AEGL 3	720	720	570	360	180

Level of Distinct Odor Awareness (LOA) = 0.11 ppm

92-52-4 Biphenyl (ppm) 10/19/2007

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	12	12	9.6	6.0	4.4
AEGL 3	NR	NR	NR	NR	NR

NR = Not recommended due to insufficient data

98-82-8 Cumene (ppm) 11/13/06

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	50	50	50	50	50
AEGL 2	550	380	300	190	130
AEGL 3	1300	920	730	460	300

Level of Distinct Odor Awareness (LOA) = 0.017 ppm

100-41-4 Ethyl benzene (ppm) 9/21/09

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	33	33	33	33	33
AEGL 2	2900	1600	1100	660	580
AEGL 3	4700	2600	1800	1000	910

100-42-5 Styrene (ppm) 12/12/06

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	20	20	20	20	20
AEGL 2	230	160	130	130	130
AEGL 3	1,900*	1,900*	1,100*	340	340

Lower Explosive Limit (LEL) = 9,000 ppm

* = $\geq$ 10% LEL

For values denoted as * safety considerations against the hazard(s) of explosion(s) must be taken into account.

Level of Distinct Odor Awareness (LOA) = 0.54 ppm

106-88-7 1,2-Butylene oxide (ppm) 9/21/09

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	72	72	72	72	72
AEGL 2	140	140	140	140	140
AEGL 3	410	410	330	210	210

Level of Distinct Odor Awareness (LOA) = 0.15 ppm

106-93-4 1,2-Dibromoethane (ppm) (May 16, 2008)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	52	26	17	7.1	4.6
AEGL 2	73	37	24	10	6.5
AEGL 3	170	76	46	17	10

106-99-0 1,3-Butadiene (ppm) 11/13/06

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	670	670	670	670	670
AEGL 2	*6700	*6700	*5300	*3400	*2700
AEGL 3	***27,000	***27,000	***22,000	**14,000	*6,800

Lower Explosive Limit (LEL) = 20,000 ppm

* = $\geq 10\%$ LEL; ** = $\geq 50\%$ LEL; *** = $\geq 100\%$ LEL

AEGL 3 - 4 hr = ** 14,000 ppm

For values denoted as * safety considerations against the hazard(s) of explosion(s) must be taken into account.

For values denoted as ** extreme safety considerations against the hazard(s) of explosion(s) must be taken into account

Level of Distinct Odor Awareness = 3.7 ppm

107-05-1 Allyl chloride (ppm) 05/16/08

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	2.8	2.8	2.8	2.8	2.8
AEGL 2	69	69	54	34	22
AEGL 3	180	180	140	90	60

116-15-4 Hexafluoropropylene (ppm) 10/19/2007

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	150	67	40	14	8.3
AEGL 2	350	150	91	32	19
AEGL 3	1800	800	480	170	100

121-45-9 Trimethyl phosphite (ppm) 8/28/2010

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	11	7.6	6.1	3.8	2.5
AEGL 2	110	77	61	38	25
AEGL 3	560	390	310	160	81

121-75-5 Malathion (mg/m³) 9/21/09

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	15	15	15	15	15
AEGL 2	150	150	120	77	50
AEGL 3	500	500	390	250	140

123-38-6 Propionaldehyde (ppm) 11/13/06

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	45	45	45	45	45
AEGL 2	330	330	260	170	110
AEGL 3	1,100	1,100	840	530	260

Level of Distinct Odor Awareness = 0.64 ppm

123-91-1 1,4-Dioxane (ppm) 10/25/04

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	17	17	17	17	17
AEGL 2	580	400	320	200	100
AEGL 3	950	950	760	480	240

Level of Distinct Odor Awareness (LOA) = 1.7 ppm

124-40-3**Dimethylamine (ppm) (May 16, 2008)**

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	10	10	10	10	10
AEGL 2	130	85	66	40	32
AEGL 3	480	320	250	150	120

Level of Distinct Odor Awareness = 0.53 ppm

127-18-4**Tetrachloroethylene (ppm) 6/12/01**

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	35	35	35	35	35
AEGL 2	230	230	230	120	81
AEGL 3	1,600	1,600	1,200	580	410

140-88-5**Ethyl acrylate (ppm) 12/12/06**

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	8.3	8.3	8.3	8.3	8.3
AEGL 2	66	45	36	19	9.4
AEGL 3	950	410	240	71	41

141-32-2**n-Butyl acrylate (ppm) 12/12/06**

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	8.3	8.3	8.3	8.3	8.3
AEGL 2	160	160	130	81	53
AEGL 3	820	820	480	170	97

298-00-0 Methyl parathion (mg/m³) 9/21/09

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	2.1	1.5	1.2	0.73	0.37
AEGL 3	6.4	4.4	3.5	2.2	1.1

NR = Not recommended due to insufficient data

298-02-2 Phorate (mg/m³) 9/21/09

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.073	0.050	0.040	0.010	0.0050
AEGL 3	0.22	0.15	0.12	0.031	0.015

NR = Not recommended due to insufficient data

382-21-8 Perfluoroisobutylene (ppm) 8/28/2010

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.67	0.22	0.11	0.028	0.014
AEGL 3	2.0	0.67	0.33	0.083	0.042

NR = Not recommended due to insufficient data

463-58-1 Carbonyl sulfide (ppm) (May 16, 2008)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	69	69	55	34	23
AEGL 3	190	190	150	95	48

NR = Not recommended due to lack of warning properties

538-07-8 Nitrogen Mustard-1 (mg/m³) 10/19/07

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.13	0.044	0.022	0.0056	0.0028
AEGL 3	2.2	0.74	0.37	0.093	0.047

NR = Not recommended due to insufficient data

555-77-1 Nitrogen Mustard-3 (mg/m³) 10/19/2007

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.13	0.044	0.022	0.0056	0.0028
AEGL 3	2.2	0.74	0.37	0.093	0.047

NR = Not recommended due to insufficient data

578-94-9 Adamsite (mg/m³) 10/19/2007

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.20	0.041	0.016	0.0022	0.00083
AEGL 2	9.7	6.8	2.6	0.36	0.14
AEGL 3	21	17	6.4	0.91	0.34

593-89-5 Methylchloroarsine (mg/m³) 10/19/2007

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.63	0.14	0.053	0.015	0.0063
AEGL 3	1.9	0.42	0.16	0.044	0.019

NR = Not recommended due to insufficient data

598-14-1 Ethyldichloroarsine (mg/m³) 10/19/2007

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.17	0.057	0.029	NR	NR
AEGL 3	0.52	0.17	0.086	NR	NR

NR = Not recommended due to insufficient data

696-28-6 Phenyl dichloroarsine (mg/m³) 10/19/2007

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.37	0.12	0.061	NR	NR
AEGL 3	1.1	0.37	0.18	NR	NR

NR = Not recommended due to insufficient data

712-48-1 Diphenylchloroarsine (mg/m³) 10/19/2007

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	1.1	0.79	0.39	0.098	0.049
AEGL 3	3.4	2.4	1.2	0.30	0.15

NR = Not recommended due to insufficient data

868-85-9 Dimethyl phosphite (ppm) 8/28/2010

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	120	120	95	60	39
AEGL 3	190	190	150	96	63

NR = Not recommended due to insufficient data

1327-53-3 Arsenic trioxide (mg/m³) 10/19/2007

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	3.7	3.7	3.0	1.9	1.2
AEGL 3	11	11	9.1	5.7	3.7

NR = Not recommended due to insufficient data

1634-04-4 Methyl-tertiary-butyl ether (MTBE) (ppm) 12/5/07

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	50	50	50	50	50
AEGL 2	1400	800	570	400	400
AEGL 3	**	*7500	*5300	*2700	*1900

Lower Explosive Limit (LEL) = (16,000)

* = $\geq 10\%$ LEL

** = $\geq 50\%$ LEL

NR = Not recommended due to insufficient data

AEGL 3 - 10 min = ** 13,000 ppm

For values denoted as * safety considerations against the hazard(s) of explosion(s) must be taken into account.

For values denoted as ** extreme safety considerations

1794-86-1 Phosgene oxime (mg/m³) 8/28/2010

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.17	0.056	0.028	0.0069	0.0035
AEGL 2	0.50	0.17	0.083	0.021	0.010
AEGL 3	36	25	13	3.1	1.6

2699-79-8 Sulfuryl fluoride (ppm) (May 16, 2008)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	27	27	21	13	6.7
AEGL 3	81	81	64	40	20

NR = Not recommended due to insufficient data

7439-97-6 Mercury Vapor (mg/m³) 8/28/2010

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	3.1	2.1	1.7	0.67	0.33
AEGL 3	16	11	8.9	2.2	2.2

7440-43-9 Cadmium (mg/m³) 8/28/2010

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.13	0.13	0.10	0.063	0.041
AEGL 2	1.4	0.96	0.76	0.40	0.20
AEGL 3	8.5	5.9	4.7	1.9	0.93

7446-11-9 Sulfur trioxide (mg/m³) 11/13/06

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.20	0.20	0.20	0.20	0.20
AEGL 2	8.7	8.7	8.7	8.7	8.7
AEGL 3	270	200	160	110	93

7550-45-0 Titanium tetrachloride (ppm) 12/12/06

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	7.6	2.2	1.0	0.21	0.094
AEGL 3	38	13	5.7	2.0	0.91

NR = Not recommended due to insufficient data

7664-93-9 Sulfuric acid (mg/m³) 11/13/06

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.20	0.20	0.20	0.20	0.20
AEGL 2	8.7	8.7	8.7	8.7	8.7
AEGL 3	270	200	160	110	93

7719-09-7 Thionyl chloride (ppm) (May 16, 2008)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	4.3	3.0	2.4	0.59	0.30
AEGL 3	25	17	14	3.4	1.7

NR = Not recommended due to insufficient data

7782-65-2 Germane (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.30	0.21	0.17	0.040	0.020
AEGL 3	0.91	0.63	0.50	0.13	0.060

NR = Not recommended due to insufficient data

7783-54-2 Nitrogen trifluoride (ppm) 9/21/09

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	1200	400	200	50	25
AEGL 2	3100	1100	530	140	68
AEGL 3	5000	1700	860	220	110

7783-61-1 Silicon tetrafluoride (ppm) (May 16, 2008)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.05	0.05	0.05	0.05	0.05
AEGL 2	6.3	4.3	3.3	0.87	0.43
AEGL 3	19	13	10	2.6	1.3

7783-79-1 Selenium hexafluoride (ppm) 10/19/2007

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.067	0.067	0.053	0.033	0.017
AEGL 2	0.11	0.11	0.087	0.057	0.028
AEGL 3	0.33	0.33	0.26	0.17	0.083

7790-94-5 Chlorosulfonic acid (mg/m³) (May 16, 2008)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.10	0.10	0.10	0.10	0.10
AEGL 2	4.4	4.4	4.4	4.4	4.4
AEGL 3	45	31	25	6.1	6.1

7803-52-3 Stibine (ppm) (May 16, 2008)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	4.2	2.9	1.5	0.36	0.18
AEGL 3	28	19	9.6	2.4	1.2

NR = Not recommended due to insufficient data

7803-62-5 Silane (ppm) 10/19/2007

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	100	100	100	NR	NR
AEGL 2	170	170	130	80	42
AEGL 3	300	300	270	170	80

NR = Not recommended due to insufficient data

8014-95-7 Oleum (mg/m³) 11/13/06

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.20	0.20	0.20	0.20	0.20
AEGL 2	8.7	8.7	8.7	8.7	8.7
AEGL 3	270	200	160	110	93

10025-67-9 Disulfur dichloride (ppm) 11/13/06

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.67	0.67	0.53	0.33	0.17
AEGL 2	8.1	8.1	6.4	4.0	2.0
AEGL 3	19	19	15	9.6	4.8

10034-85-2 * Hydrogen Iodide (ppm) 4/14/10

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	1.0	1.0	1.0	1.0	1.0
AEGL 2	150	50	25	13	13
AEGL 3	740	250	120	31	31

* Values based on Hydrogen Bromide (insufficient information for HI)

20816-12-0 Osmium tetroxide (ppm) (May 16, 2008)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.015	0.011	0.0084	0.0033	0.0017
AEGL 3	5.0	5.0	4.0	2.5	2.0

NR = Not recommended due to insufficient data

Proposed AEGLs (12)

Proposed AEGLs are published in the Federal Register for public comment following review and concurrence of Draft AEGLs by the NAC/AEGL.

62-73-7 Dichlorvos (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	0.11	0.11	0.11	0.11	0.11
AEGL 2	0.56	0.56	0.56	0.56	0.56
AEGL 3	8.0	8.0	8.0	8.0	8.0

74-88-4 Methyl iodide (ppm)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	54	31	22	11	11
AEGL 2	200	120	82	41	29
AEGL 3	670	400	290	150	98

116-06-3 Aldicarb (mg/m³)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.16	0.11	0.087	0.053	0.027
AEGL 3	0.47	0.32	0.26	0.16	0.081

141-66-2 Dicrotophos (mg/m³)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.53	0.37	0.29	0.073	0.037
AEGL 3	1.6	1.1	0.88	0.22	0.11

NR = Not recommended due to insufficient data

6923-22-4 Monocrotophos (mg/m³)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.43	0.31	0.24	0.21	0.10
AEGL 3	1.3	0.92	0.73	0.62	0.31

NR = Not recommended due to insufficient data

7723-14-0 Red Phosphorus (mg/m³)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	6.7	4.7	3.7	0.93	0.47
AEGL 2	20	14	11	2.8	1.4
AEGL 3	85	59	47	12	5.9

8006-61-9 Automotive Gasoline (unleaded) (mg/m³)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	730	730	730	730	730
AEGL 2	*7500	*7500	*7500	*7500	*7500
AEGL 3	ND	ND	ND	ND	ND

ND = Not determined under normal exposure scenarios

Lower Explosive Limit (LEL) = 11,000 ppm

* ≥10% LEL; ** ≥50% LEL; *** ≥100% LEL

AEGL 2 is higher than 1/10 of the Lower Exposure Limit (LEL = 62,000 mg/m³)

For values denoted as * safety considerations against the hazard(s) of explosion(s) must be taken into account.

10265-92-6 Methamidophos (mg/m³)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	2.4	2.4	1.9	1.2	0.61
AEGL 2	4.5	4.5	3.6	2.3	1.1
AEGL 3	10	10	8.1	5.1	2.5

13171-21-6 Phosphamidon (mg/m³)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	0.37	0.37	0.30	0.19	0.093
AEGL 3	1.1	1.1	0.90	0.57	0.28

NR = Not recommended due to insufficient data

16752-77-5 Methomyl (mg/m³)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	7	7	5.7	3.3	1.7
AEGL 3	21	21	17	10	5.2

NR = Not recommended due to insufficient data

22224-92-6 Fenamiphos (mg/m³)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	1.0	0.80	0.70	0.53	0.43
AEGL 3	3.0	2.4	2.1	1.6	1.3

NR = Not recommended due to insufficient data

23135-22-0 Oxamyl (mg/m³)

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	3.6	1.8	1.2	0.49	0.32
AEGL 2	5.3	2.7	1.8	0.73	0.47
AEGL 3	16	8.2	5.3	2.2	1.4

Holding AEGLs (46)

Holding Status AEGLs have been reviewed by the NAC/AEGL Committee and are under further review. At this time values are not being developed.

CAS Number	Chemical Name
	Fluoroacetate salts
62-74-7	Sodium fluoroacetate
75-36-5	Acetyl Chloride
75-74-1	Tetramethyl lead
76-02-8	Trichloroacetyl Chloride
77-10-0	Phencyclidine
80-12-6	Tetramethylene disulfotetramine
80-63-7	Methyl 2-chloroacrylate
97-02-9	2,4-Dinitroaniline
107-49-3	Tetraethyl pyrophosphate
110-78-1	n-Propyl isocyanate
144-49-0	Monofluoroacetic acid
151-38-2	Methoxyethyl mercuric acetate
371-62-0	Ethylene fluorohydrin
453-18-9	Methyl fluoroacetate
463-71-8	Thiophosgene
503-38-8	Diphosgene
506-77-4	Cyanogen chloride
556-64-9	Methyl thiocyanate
561-27-3	Diacetyl morphine
814-68-6	Acrylyl chloride
950-35-6	Methyl paroxon
993-43-1	Ethyl phosphonothioic dichloride
1303-28-2	Arsenic pentoxide
1498-40-4	Ethyl phosphonous dichloride
1609-86-5	t-Butyl isocyanate
1737-93-5	3,5-Dichloro-2,4,6-trifluoropyridine
1795-48-8	Isopropyl isocyanate
1873-29-6	Isobutyl isocyanate
2696-92-6	Nitrosyl chloride
354-32-5	Trifluoroacetyl chloride
4300-97-4	Chloropivaloyl chloride

CAS Number	Chemical Name
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4685-14-7	Paraquat
6427-21-0	Methoxymethyl isocyanate
7775-14-6	Sodium dithionite
7783-60-0	Sulfur tetrafluoride
7783-82-6	Tungsten hexafluoride
7784-34-1	Arsenic trichloride
7786-34-7	Mevinphos (mg/m ³)
7789-21-1	Fluorosulfonic acid
7803-49-8	Hydroxylamine
7803-54-5	Magnesium diamide
10294-34-5	Boron Trichloride
10544-73-7	Nitrogen trioxide
10545-99-0	Sulfur dichloride

9009-86-3**Ricin (mg/m³)***

	10 min	30 min	60 min	4 hr	8 hr
AEGL 1	NR	NR	NR	NR	NR
AEGL 2	NR	NR	NR	NR	NR
AEGL 3	0.033	0.010	0.0048	NR	NR

* Tentative Ricin values pending receipt and review of data for April 13-15 2010 NAC/AEGL Meeting

Revision History

July 27, 2018 revisions

Changed chloroformates from Interim to Final status and revised AEGL values as appropriate.

June 9, 2015 to March 10, 2016 revisions

Added Table of Contents

75-01-4 Vinyl chloride

Changed “Lower Explosive Limit (LEL) = 38,000 ppm to 293,000 ppm;” to “Lower Explosion Limit (LEL) range = 38,000 ppm to 293,000 ppm;”

108-05-4 Vinyl acetate (ppm)

Added “Level of Distinct Odor Awareness (LOA) = 0.25 ppm”

108-95-2 Phenol (ppm)

Replaced “Awarenes” with “Awareness”

151-56-4 Ethylenimine (ppm)

Replaced “Level of Distinct Odor Awareness = 11 ppm” with “Level of Distinct Odor Awareness = 10.9 ppm”

67-56-1 Methanol (ppm)

Replaced “Awarenes” with “Awareness”