

\*Please refer to the key at the end of the table.\*

## Current ERPG® Values (2015)

Chemical (CAS Number)	ERPG-1	ERPG-2	ERPG-3	LEL*** [Caution: See Footnotes]
Acetaldehyde (75-07-0).....	10 ppm★	200 ppm	1000 ppm	
Acetic Acid (64-19-7).....	5 ppm★	35 ppm	250 ppm	
Acetic Anhydride (108-24-7).....	0.5 ppm★	15 ppm	100 ppm	
Acrolein (107-02-8).....	0.05 ppm★	0.15 ppm	1.5 ppm	
Acrylic Acid (79-10-7).....	1 ppm★	50 ppm	250 ppm	
Acrylonitrile (107-13-1).....	10 ppm★	35 ppm	75 ppm	
Allyl Chloride (107-05-1).....	3 ppm★	40 ppm	300 ppm	
Ammonia (7664-41-7).....	25 ppm★	150 ppm	1500 ppm	
Arsine (7784-42-1).....	NA†	0.5 ppm	1.5 ppm	
<b>Benzene (71-43-2) *</b> .....	50 ppm★	150 ppm	1000 ppm	
Benzene, ethylenated, by-products from (Dowtherm Q) (68987-42-8).....	ID‡	150 mg/m <sup>3</sup>	ID‡	
Benzoyl Chloride (98-88-4).....	0.3 ppm★	5 ppm	20 ppm	
Benzyl Chloride (100-44-7).....	1 ppm★	10 ppm	50 ppm	
Beryllium (7440-41-7).....	NA†	25 µg/m <sup>3</sup>	100 µg/m <sup>3</sup>	
Bis (Chloromethyl) Ether (542-88-1).....	ID‡	0.1 ppm	0.5 ppm	

Chemical (CAS Number)	ERPG-1	ERPG-2	ERPG-3	LEL*** [Caution: See Footnotes]
Boron Trifluoride (7637-07-2).....	2 mg/m <sup>3</sup> ★	30 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>	
Bromine (7726-95-6).....	0.1 ppm★	0.5 ppm	5 p ppm	
<b>1,3-Butadiene (106-99-0) *</b> .....	10 ppm★	500 ppm	<b>5000 ppm</b>	<b>20,000 ppm</b>
n-Butyl Acetate (123-86-4).....	5 ppm★	200 ppm	<b>3000 ppm</b>	<b>17,000 ppm</b>
n-Butyl Acrylate (141-32-2).....	0.05 ppm★	25 ppm	250 ppm	
n-Butyl Isocyanate (111-36-4).....	0.01 ppm	0.05 ppm	1 ppm	
Carbon Disulfide (75-15-0).....	1 ppm★	50 ppm	500 ppm	
Carbon Monoxide (630-08-0).....	200 ppm	350 ppm	500 ppm	
Carbon Tetrachloride (56-23-5).....	20 ppm★	100 ppm	750 ppm	
Chlorine (7782-50-5).....	1 ppm★	3 ppm	20 ppm	
Chlorine Dioxide (10049-04-4).....	NA†	0.5 ppm	3 ppm	
Chlorine Trifluoride (7790-91-2).....	0.1 ppm★	1 ppm	10 ppm	
Chloroacetyl Chloride (79-04-9).....	0.05 ppm★	0.5 ppm	10 ppm	
o-Chlorobenzylidene Malononitrile (2698-41-1).....	0.005 mg/m <sup>3</sup> ★	0.1 mg/m <sup>3</sup>	25 mg/m <sup>3</sup>	
Chloroform (67-66-3).....	NA†	50 ppm	5000 ppm	
Chloromethyl Methyl Ether (107-30-2).....	NA†	1 ppm	10 ppm	
Chloropicrin (76-06-2).....	0.075 ppm	0.15 ppm	1.5 ppm	
Chlorosulfonic Acid (7790-94-5).....	2 mg/m <sup>3</sup> ★	10 mg/m <sup>3</sup>	30 mg/m <sup>3</sup>	

Chemical (CAS Number)	ERPG-1	ERPG-2	ERPG-3	LEL*** [Caution: See Footnotes]
Chlorotrifluoroethylene (79-38-9).....	20 ppm	100 ppm	300 ppm	
Cobalt Hydrocarbonyl (16842-03-8) (Values are given as Cobalt.) .....	ID†	0.9 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	
Crotonaldehyde (4170-30-3).....	0.2 ppm★	5 ppm	15 ppm	
Cyanogen Chloride (506-77-4).....	NA†	0.05 ppm	4 ppm	
Diborane (19287-45-7) .....	NA†	1 ppm	3 ppm	
1,2-Dichloroethane (107-06-2) .....	50 ppm★	200 ppm	300 ppm	
2,4-Dichlorophenol (120-83-2) .....	0.2 ppm★	2 ppm	20 ppm	
Dicyclopentadiene (77-73-6).....	0.01 ppm★	5 ppm	75 ppm	
Diethylbenzenes, mixed isomers (Dowtherm J) (25340-17-4) .....	10 ppm★	100 ppm	500 ppm	
Diketene (674-82-8).....	1 ppm★	5 ppm	50 ppm	
<b>Dimethylamine (124-40-3) *</b> .....	0.6 ppm★	100 ppm	350 ppm	
<b>Dimethyl Disulfide (624-92-0) *</b> .....	0.01 ppm★	50 ppm	250 ppm	
Dimethylformamide (68-12-2).....	2 ppm★	100 ppm	200 ppm	
Dimethyl Sulfide (75-18-3).....	0.5 ppm★	1000 ppm	<b>5000 ppm</b>	<b>22,000 ppm</b>
Epichlorohydrin (106-89-8).....	5 ppm★	20 ppm	100 ppm	
Ethanol (64-17-5).....	1800 ppm★	<b>3300 ppm</b>	NA†	<b>33,000 ppm</b>

Chemical (CAS Number)	ERPG-1	ERPG-2	ERPG-3	LEL*** [Caution: See Footnotes]
Ethyl Acrylate (140-88-5) .....	0.01 ppm★	30 ppm	300 ppm	
Ethyl Chloroformate (541-41-3).....	ID‡	5 ppm	10 ppm	
2-Ethyl Hexanol (104-76-7).....	0.1 ppm★	100 ppm	200 ppm	
Ethylene Oxide (75-21-8) .....	NA†	50 ppm	500 ppm	
Ethylidene Norbornene (16219-75-3) .....	0.2 ppm★	100 ppm	500 ppm	
Fluorine (7782-41-4) .....	0.5 ppm★	5 ppm	20 ppm	
Fluorosulfonic acid (7789-21-1).....	2 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	30 mg/m <sup>3</sup>	
Formaldehyde (50-00-0) .....	1 ppm★	10 ppm	40 ppm	
Formic Acid (64-18-6).....	3 ppm★	25 ppm	250 ppm	
Furfural (98-01-1).....	2 ppm★	10 ppm	100 ppm	
Gasoline (86290-81-5).....	200 ppm★	1000 ppm	4000 ppm	14,000 ppm
<b>Glutaraldehyde (111-30-8) *</b> .....	0.2 ppm★	1 ppm	5 ppm	
HCFC-123 (2,2-Dichloro-1,1,1-Trifluoroethane) (306-83-2) .....	ID‡	1000 ppm	10,000 ppm	
HCFC-124 (2-Chloro-1,1,1,2-Tetrafluoroethane) (2837-89-0).....	1000 ppm	5000 ppm	10,000 ppm	
HCFC-142b (1-Chloro-1,1-Difluoroethane) (75-68-3).....	10,000 ppm	15,000 ppm	25,000 ppm	60,000 ppm

Chemical (CAS Number)	ERPG-1	ERPG-2	ERPG-3	LEL*** [Caution: See Footnotes]
Hexachlorobutadiene (87-68-3).....	1 ppm	3 ppm	10 ppm	
Hexafluoroacetone (684-16-2).....	NA†	1 ppm	50 ppm	
Hexafluoropropylene (116-15-4).....	10 ppm	50 ppm	500 ppm	
1-Hexene (592-41-6).....	NA†	500 ppm	5000 ppm	12,000 ppm
HFC-152a (1,1-Difluoroethane) (75-37-6).....	10,000 ppm	15,000 ppm	25,000 ppm	39,000 ppm
HFO-1234yf (2,3,3,3-Tetrafluoropropene) (754-12-1) .....	NA†	24,000 ppm	NA†	65,000 ppm
HFO-1234ze (1,3,3,3-Tetrafluoropropylene) (29118-24-9).....	NA†	15,000 ppm	69,000 ppm	
Hydrazine (302-01-2).....	0.5 ppm	5 ppm	30 ppm	
Hydrogen Chloride (7647-01-0).....	3 ppm★	20 ppm	150 ppm	
Hydrogen Cyanide (74-90-8).....	NA†	10 ppm	25 ppm	
Hydrogen Fluoride (7664-39-3)** .....	2 ppm★	20 ppm	50 ppm	
Hydrogen Peroxide (7722-84-1).....	10 ppm	50 ppm	100 ppm	
Hydrogen Selenide (7783-07-5) .....	NA†	0.2 ppm	2 ppm	
Hydrogen Sulfide (7783-06-4).....	0.1 ppm★	30 ppm	100 ppm	
Iodine (7553-56-2).....	0.1 ppm★	0.5 ppm	5 ppm	
Isobutyronitrile (78-82-0).....	ID‡	30 ppm	100 ppm	

Chemical (CAS Number)	ERPG-1	ERPG-2	ERPG-3	LEL*** [Caution: See Footnotes]
2-Isocyanatoethyl Methacrylate (30674-80-7).....ID‡		0.1 ppm	1 ppm	
Isoprene (78-79-5).....5 ppm★		1000 ppm	4000 ppm	15,000 ppm
Isopropyl Chloroformate (108-23-6).....ID‡		5 ppm	20 ppm	
Lithium Hydride (7580-67-8).....0.025 mg/m <sup>3</sup>		0.1 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>	
Maleic Anhydride (108-31-6) .....0.2 ppm		2 ppm	20 ppm	
MDI (Methylene Diphenyl Diisocyanate) (101-68-8) .....NA†		5 mg/m <sup>3</sup>	55 mg/m <sup>3</sup>	
Mercury Vapor (7439-97-6) .....NA†		0.25 ppm	0.5 ppm	
Methanol (67-56-1).....200 ppm		1000 ppm	5000 ppm	
Methyl Bromide (74-83-9) .....NA†		50 ppm	200 ppm	
Methyl Chloride (74-87-3) .....150 ppm★		1000 ppm	3000 ppm	
Methyl Chloroformate (79-22-1) .....NA†		2 ppm	5 ppm	
Methyl Iodide (74-88-4).....25 ppm		50 ppm	125 ppm	
Methyl Isocyanate (624-83-9) .....0.025 ppm		0.25 ppm	1.5 ppm	
Methyl Mercaptan (74-93-1).....0.005 ppm★		25 ppm	100 ppm	
Methyl tert-Butyl Ether (MTBE) (1634-04-4).....50 ppm★		1000 ppm	5000 ppm	16,000 ppm
Methylene Chloride (75-09-2) .....300 ppm★		750 ppm	4000 ppm	
Monomethylamine (74-89-5) *.....10 ppm★		100 ppm	500 ppm	

Chemical (CAS Number)	ERPG-1	ERPG-2	ERPG-3	LEL*** [Caution: See Footnotes]
Nitric Acid WFNA (7697-37-2) .....	1 ppm★	10 ppm	78 ppm	
Nitrogen Dioxide (10102-44-0).....	1 ppm★	15 ppm	30 ppm	
Nitrogen Trifluoride (7783-54-2) .....	NA†	400 ppm	800 ppm	
1-Octanol (111-87-5).....	5 ppm★	20 ppm	150 ppm	
1-Octene (111-66-0) .....	40 ppm★	<b>800 ppm</b>	<b>2000 ppm</b>	<b>8000 ppm</b>
Oleum (8014-95-7) [See Sulfuric Acid] .....				
Perchloroethylene (127-18-4).....	100 ppm★	200 ppm	1000 ppm	
Perfluoroisobutylene (382-21-8).....	NA†	0.1 ppm	0.3 ppm	
Phenol (108-95-2).....	10 ppm★	50 ppm	200 ppm	
Phosgene (75-44-5).....	NA†	0.5 ppm	1.5 ppm	
Phosphine (7803-51-2).....	NA†	0.5 ppm	5 ppm	
Phosphoric Acid (7664-38-2).....	3 mg/m <sup>3</sup>	30 mg/m <sup>3</sup>	150 mg/m <sup>3</sup>	
<b>Phosphorus Pentoxide (1314-56-3) *</b> .....	1 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	50 mg/m <sup>3</sup>	
<b>Phosphorus Trichloride (7719-12-2) *</b> .....	0.5 ppm	3 ppm	15 ppm	
Propylene Glycol Methyl Ether Acetate (108-65-6 a-isomer) (70657-70-4 b-isomer).....	50 ppm★	1000 ppm	<b>5000 ppm</b>	<b>15,000 ppm</b>
Propylene Oxide (75-56-9).....	50 ppm★	250 ppm	750 ppm	
Silane, Dimethyldichloro- (75-78-5).....	2 ppm★	10 ppm	75 ppm	

Chemical (CAS Number)	ERPG-1	ERPG-2	ERPG-3	LEL*** [Caution: See Footnotes]
Silane, Methyltrichloro- (75-79-6).....	0.5 ppm★	3 ppm	15 ppm	
Silane, Tetrachloro- (10026-04-7) .....	0.75 ppm★	5 ppm	37 ppm	
Silane, Tetraethoxy- (78-10-4).....	25 ppm★	100 ppm	300 ppm	
Silane, Tetramethoxy- (681-84-5).....	NA†	10 ppm	20 ppm	
Silane, Trichloro- (10025-78-2) .....	1 ppm★	3 ppm	25 ppm	
Silane, Triethoxy- (998-30-1).....	0.5 ppm	4 ppm	10 ppm	
Silane, Trimethoxy- (2487-90-3).....	0.5 ppm	2 ppm	5 ppm	
Silane, Trimethylchloro- (75-77-4) .....	3 ppm★	20 ppm	150 ppm	
Silane, Vinyl Trichloro- (75-94-5) .....	0.5 ppm★	5 ppm	50 ppm	
Sodium Hydroxide (1310-73-2) .....	0.5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	50 mg/m <sup>3</sup>	
Stibine (7803-52-3).....	ID‡	0.5 ppm	1.5 ppm	
Styrene (100-42-5) .....	50 ppm★	250 ppm	1000 ppm	
Sulfur Dioxide (7446-09-5) .....	0.3 ppm★	3 ppm	25 ppm	
Sulfur Trioxide (7446-11-9) [See Sulfuric Acid] .....				
Sulfuric Acid (Oleum [8014-95-7], Sulfur Trioxide [7446-11-9], and Sulfuric Acid [7664-93-9]) .....	2 mg/m <sup>3</sup> ★	10 mg/m <sup>3</sup>	120 mg/m <sup>3</sup>	
Sulfuryl Chloride (7791-25-5) .....	0.3 ppm★	3 ppm	15 ppm	



Chemical (CAS Number)	ERPG-1	ERPG-2	ERPG-3	LEL*** [Caution: See Footnotes]
<b>TDI (Toluene 2,4- (2,6-) Diisocyanate)</b>				
(584-84-9), (91-08-7) † *	0.01 ppm★	0.15 ppm	0.6 ppm	
Tetrafluoroethylene (116-14-3)	200 ppm	1000 ppm	10,000 ppm	100,000 ppm
Tetrahydrofuran (109-99-9)	100 ppm★	500 ppm	5000 ppm	18,000 ppm
Thionyl Chloride (7719-09-7)	0.2 ppm★	2 ppm	10 ppm	
Titanium Tetrachloride (7550-45-0)	5 mg/m³★	20 mg/m³	100 mg/m³	
Toluene (108-88-3)	50 ppm★	300 ppm	1000 ppm	
1,1,1-Trichloroethane (71-55-6)	350 ppm★	700 ppm	3500 ppm	
Trichloroethylene (79-01-6)	100 ppm★	500 ppm	5000 ppm	
Trimethylamine (75-50-3) *	0.1 ppm★	100 ppm	500 ppm	
Triuranium Octaoxide (1344-59-8)	ID‡	10 mg/m³	50 mg/m³	
Uranium Dioxide (1344-57-6)	ID‡	10 mg/m³	30 mg/m³	
Uranium Hexafluoride (7783-81-5)	5 mg/m³	15 mg/m³	30 mg/m³	
Uranium Trioxide (1344-58-7)	ID‡	0.5 mg/m³	3 mg/m³	
Vinyl Acetate (108-05-4)	5 ppm★	75 ppm	500 ppm	
Vinyl Chloride (75-01-4)	500 ppm★	5000 ppm	20,000 ppm	36,000 ppm
Vinylidene Chloride (75-35-4)	ID‡	500 ppm	1000 ppm	

**BOLDED** Chemical Name: Part of 2015 Update Set

Bolded with asterisk\*: REVISED chemical

Bolded without asterisk: NEW chemical

\*\* Addendum published in 1999 with new 10-minute values (ERPG-1: 2 ppm; ERPG-2: 50 ppm; ERPG-3: 170 ppm)

† NOTE: Users of this document are cautioned that there is no known or accepted threshold level at which persons sensitized to diisocyanates can be exposed to TDI without potentially experiencing a respiratory-related effect. Therefore, the ERPGs may not offer protection for those who are sensitized to diisocyanates. This assumption is based on studies in rats where results with 2,6-TDI were described as similar to 2,4-TDI for respiratory irritation. (Weyel 1982; Sangha and Alarie, 1979)

NA† = not appropriate

ID‡ = insufficient data

⊛ = Odor should be detectable near ERPG-1. (See introductory text “ERPG-1 Odor Detection Indicator and Objectionable Odor”.)

\*\*\*Lower Explosive Limit (LEL) Notations for ERPG values:

100% or more LEL = ***Bold Red Italics Underlined***

50-99% LEL = ***Bold Red Italics***

10-49% LEL = **Bold Red**

<10% LEL = Regular Font

\*\*\*LEL Column: CAUTION—If LEL value is shown, one or more ERPG values are 10% LEL or more. The lack of an entry in the LEL column should not be interpreted that the chemical is not flammable, but only that the ERPG values for that chemical do not exceed 10% of the LEL. (See introductory text “Lower Explosive Limit Warnings”.)

NOTE: This information includes all approved ERPG values as of February 2015. ERPG documents reviewed, balloted, and approved by the Committee after this date will be eligible for inclusion in the 2016 ERPG Document Set.