

TABLE 3. MAXIMUM ALLOWABLE CONCENTRATION OF GASES AND VAPORS
(Concluded)

SUBSTANCE	ASA STANDARDS M.A.C. ppm ^b by volume	THRESHOLD LIMIT VALUES A.C.G.I.H. ^a 1956	
		ppm ^b	g/cu m or Oz/1000 cu ft
2-Nitropropane.....		50	0.180
Nitrotoluene.....		5	0.030
Octane.....		500	2.350
Ozone.....		0.1	0.0002
Pentane.....		1000	2.950
Pentanone (methyl propyl ketone).....		200	0.700
Perchloroethylene (tetrachloroethylene).....		200	1.350
Phenol.....		5	0.019
(x) Phenylhydrazine.....		5	0.022
Phosgene (carbonyl chloride).....		1	0.004
Phosphine.....		0.05	0.00007
Phosphorus trichloride.....		0.5	0.003
Propyl acetate.....		200	0.840
Propyl alcohol (isopropyl alcohol).....		400	0.980
Propyl ether (isopropyl ether).....		500	2.100
Propylene dichloride (1,2-dichloropropane).....		75	0.350
(x) Propylene imine.....		25	0.080
(x) Pyridine.....		10	0.030
(x) Quinine.....		0.1	0.0004
Stibine.....		0.1	0.0005
Stoddard solvent.....		500	2.90
Styrene monomer (phenylethylene).....		200	0.850
Sulfur dioxide.....		10	0.025
(x) Sulfur hexafluoride.....		1000	6.000
Sulfur monochloride.....		1	0.006
(x) Sulfur pentafluoride.....		0.025	0.00025
(x) p-Tertiarybutyltoluene.....		10	0.060
1,1,2,2-Tetrachloroethane.....		5	0.035
(x) Tetranitromethane.....		1	0.008
Toluene (toluol).....	200	200	0.750
o-Toluidine.....		5	0.022
Trichloroethylene.....	200	200	1.050
(x) Trifluoromonomobromomethane.....		1000	6.100
Turpentine.....		100	0.550
Vinyl chloride (chloroethylene).....		500	1.30
Xylene (xylol).....	200	200	0.870

^a A.C.G.I.H. = American Conference of Governmental Industrial Hygienists. Reprinted by permission from A.M.A. Archives of Industrial Health, August 1956, Vol. 14, pp. 186-189.

^b Parts of vapor or gas per million parts of air by volume.

(x) These values appeared in A.C.G.I.H. tentative list for 1955.

apply a reasonable safety factor to the ventilation estimate without consideration of the concentrations of gases or vapors that approach the danger point. Safety engineers prefer to limit the concentration to $\frac{1}{4}$ or $\frac{1}{5}$ of the lower explosive limit, and this fact should be given full weight in determining the capacity and design of ventilating equipment. Rarely should consideration be given to operation above the upper explosive limit in the open areas of buildings or rooms—even though unoccupied—because the danger of temporary drop of gas concentration to a point within the explosive range is too great.

Ability of a flammable liquid to form explosive mixtures is determined largely by its vapor pressure, volatility, or rate of evaporation. Flash point is a convenient method of expressing this property in terms of the temperature scale. It may be defined as the temperature to which a combustible liquid must be heated to produce a flash when a small flame is passed across the surface of the liquid. The higher the flash point, the

TABLE 4. LIMITS FOR TOXIC DUSTS, FUMES AND MISTS

SUBSTANCE	A.S.A. STANDARDS M.A.C. g/cu m ^a	THRESHOLD LIMIT VALUES, A.C.G.I.H. 1956 g/cu m ^a
(x) Aldrin (1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-dimethanonaphthalene).....		0.00025
(x) Ammate (ammonium sulfamate).....		0.015
Antimony.....		0.0005
Arsenic.....		0.0005
Barium (soluble compounds).....		0.0005
Cadmium oxide fume.....		0.0001
(x) Chlordane (1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindane).....		0.002
(x) Chlorinated diphenyl oxide.....		0.0005
Chlorodiphenyl (42% chlorine).....		0.001
Chromic acid and chromates (as CrO ₃).....	0.0001	0.0001
(x) Crag herbicide (sodium 2-[2,4-dichlorophenoxy] ethanol hydrogen sulfate).....		0.015
Cyanide (as CN).....		0.005
(x) 2,4-D (2,4-dichlorophenoxyacetic acid).....		0.010
(x) Dieldrin (1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4,5,8-dimethanonaphthalene).....		0.00025
Dinitrotoluene.....		0.0015
Dinitro-o-cresol.....		0.0002
(x) EPN (O-ethyl O-p-nitrophenyl thionobenzenephosphonate).....		0.0005
(x) Ferrovandium dust.....		0.001
Fluoride.....		0.0025
(x) Hydroquinone.....		0.002
Iron oxide fume.....		0.015
Lead.....	0.00015	0.00015
(x) Lindane (hexachlorocyclohexane, gamma isomer).....		0.0005
Magnesium oxide fume.....		0.015
(x) Malathion (O,O-dimethyl dithiophosphate of diethyl mercaptosuccinate).....		0.015
Manganese.....		0.006
Mercury.....	0.0001	0.0001
(x) Mercury (organic compounds).....		0.00001
(x) Methoxychlor (2,2-di-p-methoxyphenyl-1,1,1-trichloroethane).....		0.015
(x) Molybdenum (soluble compounds).....		0.005
(insoluble compounds).....		0.015
Parathion (O,O-diethyl O-p-nitrophenyl thiophosphate).....		0.0001
Pentachloronaphthalene.....		0.0005
Pentachlorophenol.....		0.0005
Phosphorus (yellow).....		0.0001
Phosphorus pentachloride.....		0.001
Phosphorus pentasulfide.....		0.001
(x) Picric acid.....		0.0001
Selenium compounds (as Se).....		0.0001
(x) Sodium hydroxide.....		0.002
Sulfuric acid.....		0.001
(x) TEDP (tetraethyl dithionopyrophosphate).....		0.0002
(x) TEPP (tetraethyl pyrophosphate).....		0.00005
Tellurium.....		0.0001
(x) Tetryl (2,4,6-trinitrophenylmethylamine).....		0.0015
Titanium dioxide.....		0.015
Trichloronaphthalene.....		0.005
Trinitrotoluene.....		0.0015
Uranium (soluble compounds).....		0.00005
(insoluble compounds).....		0.00025
(x) Vanadium (V ₂ O ₅ dust).....		0.0005
(V ₂ O ₅ fume).....		0.0001
Zinc oxide fumes.....		0.015
(x) Zirconium compounds (as Zr).....		0.005

^a Grams of dust, fume, or mist per cubic meter of air.

(x) These values appeared on the A.C.G.I.H. tentative list, for 1955. Radioactivity: For permissible concentrations of radioisotopes in air, see "Maximum Permissible Amounts of Radioisotopes in the Human Body and Maximum Permissible Concentrations in Air and Water," Handbook 52, U. S. Department of Commerce, National Bureau of Standards, March, 1953. In addition, see "Permissible Dose from External Sources of Ionizing Radiation," Handbook 59, U. S. Department of Commerce, National Bureau of Standards, September 24, 1954. Table 4 values reprinted by permission from A.M.A. Archives of Industrial Health, August 1956, Vol. 14 pp. 186-189.