	Substance	ppm*	Mg/M³**
++	Dimethylphthalate	–	5.
++	Diphenyl	0.2	1.
	Ethylamine	10.	18.
	Ethyl sec-amyl ketone (5-methyl-3-heptanone)	25.	130.
	Ethyl benzene	100.	435.
	Ethyl butyl ketone (3-Heptanone)	50.	230.
+C	Ethylene glycol dinitrate &/or nitroglycerin-Skin	0.02†	0.1†
	Ethylene imine-Skin	0.5	1.
C	Ethyl mercaptan	10.	25.
	N-Ethylmorpholine-Skin	20.	94.
	Fibrous glass	–	5.
	Formic acid	5.	9.
++	Gasoline	A⁶	
	sec-Hexyl acetate	50.	300.
++	Hexachloronaphthalene - Skin	–	0.2
	Iron oxide fume	–	10.
	Isoamyl acetate	100.	525.
	Isobutyl acetate	150.	700.
++	Isobutyl alcohol	100.	300.
	Isopropyl acetate	250.	950.
+	Maleic anhydride	0.25	1.
	Methylamine	10.	12.
	Methyl (n-amyl) ketone (2-Heptanone)	100.	465.
	Methyl iodide - Skin	5.	28.
	Methyl isocyanate - Skin	0.02	0.05
C	Monomethyl hydrazine - Skin	0.2	0.35
+	Naphtha (coal tar)	100.	400.
++	Nitric oxide	25.	30.
++	Octachloronaphthalene - Skin	–	0.1
	Oxalic acid	–	1.
++	Paraquat - Skin	–	0.5
	Phenyl ether (vapor)	1.	7.
	Phenyl ether-Biphenyl mixture (vapor)	1.	7.
+	Phenyl glycidyl ether (PGE)	10.	62.
	Pival (2-Pivalyl-1, 3-indandione)	–	0.1
++	Propyl alcohol	200.	450
	Propylene imine - Skin	2.	5.
	Rhodium, Metal fume and dusts	–	0.1
	Soluble salts	–	0.001
++	Ronnel	–	15.
	Selenium hexafluoride	0.05	0.4
	Tellurium hexafluoride	0.02	0.2
++C	Terphenyls	1.	9.4
++	Tetrachloronaphthalene - Skin	–	2.
	Tetraethyl lead (TML) (as lead) - Skin	–	0.075
	Tetramethyl succinonitrile - Skin	0.5	3.
	Tremolite	5 mppcf	–
++	Tributyl phosphate	–	5.
	1, 1, 2-Trichloroethane - Skin	10.	45.
	Xylene	100.	435.
++	Zinc chloride	–	1.

\+ 1966 Revision
++ 1966 Additions
† For intermittent exposure only

Appendix A

A[1] **Benzidine** Because of high incidence of bladder tumors in man, any exposure, including skin, is extremely hazardous.

A[2] **β-Naphthylamine.** Because of the extremely high incidence of bladder tumors in workers handling this compound and the inability to control exposures, β-naphthylamine has been prohibited from manufacture, use and other activities that involve human contact by the State of Pennsylvania.

A[3] **N-Nitrosodimethylamine** Because of extremely high toxicity and presumed carcinogenic potential of this compound, contact by any route should not be permitted.

A[4] **Polytetrafluoroethylene* decomposition products.** Thermal decomposition of the fluorocarbon chain in air leads to the formation of oxidized products containing carbon, fluorine and oxygen. Because these products decompose by hydrolysis in alkaline solution, they can be quantitatively determined in air as fluoride to provide an index of exposure. No TLV is recommended pending determination of the toxicity of the products, but air concentrations should be minimal.

A[5] **β Propiolactone** Because of high acute toxicity and demonstrated skin tumor production in animals, contact by any route should be avoided.

A[6] **Gasoline.** The composition of gasoline varies greatly and thus a single TLV for all types of gasoline is no longer applicable. In general, the aromatic hydrocarbon content will determine what TLV applies. Consequently the content of benzene, other aromatics and additives should be determined to arrive at the appropriate TLV (Elkins, et al. A.I.H.A.J. 24, 99, 1963).

* Trade Names: Algoflon, Fluon, Halon, Teflon, Tetran

Appendix B

B.1 THRESHOLD LIMIT VALUES FOR MIXTURES

When two or more hazardous substances are present, their combined effect, rather than that of either individually, should be given primary consideration. In the absence of information to the contrary, the effects of the different hazards should be considered as additive. That is, if the sum of the following fractions,

$$\frac{C_1}{T_1}+\frac{C_2}{T_2}+\ldots\frac{C_n}{T_n}$$

exceeds unity, then the threshold limit of the mixture should be considered as being exceeded. C_1 indicates the observed atmospheric concentration, and T_1 the corresponding threshold limit, (See Example 1A.a.).

Exceptions to the above rule may be made when there is good reason to believe that the chief effects of the different harmful substances are not in fact additive, but independent as when purely local effects on different organs of the body are produced by the various components of the mixture. In such cases the threshold limit ordinarily is exceeded only when at least one member of the series ($\frac{C_1}{T_1}$ or $\frac{C_2}{T_2}$ etc.) itself has a value exceeding unity, (See Example 1A.b.)

Antagonistic action or potentiation may occur with some combinations of atmospheric contaminants. Such cases at present must be determined individually. Potentiating or antagonistic agents are not necessarily harmful by themselves. Potentiating effects of exposure to such agents by routes other than that of inhalation is also possible, e.g. imbibed alcohol and inhaled narcotic (trichloroethylene). Potentiation is characteristically exhibited at high concentrations, less probably at low.

When a given operation or process characteristically emits a number of harmful dusts, fumes, vapors or gases, it will frequently be only feasible to attempt to evaluate the hazard by measurement of a single substance. In such cases, the threshold limit used for this substance should be reduced by a suitable factor, the magnitude of which will depend on the number, toxicity and relative quantity of the other contaminants ordinarily present.

Examples of processes which are typically associated with two or more harmful atmospheric contaminants are welding, automobile repair, blasting, painting, lacquering, certain foundry operations, diesel exhausts, etc. (Example 2.)