OCCUPATIONAL HEALTH BULLETIN

NORTH CAROLINA STATE BOARD OF HEALTH*

J. W. R. Norton, M. D., State Health Director

Raleigh

THRESHOLD LIMIT VALUES FOR 1962

CONSULT LOCAL HEALTH DEPARTMENTS AND PHYSICIANS

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CONTROL HEALTH HAZARDS TO EMPLOYEES AT WORK

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PREVENT INDUSTRIAL DISEASES

*Made Available by
The Occupational Health Section
(SEE INSIDE COVER)

ADVISORY GUIDE SERIES - I - 1962 Revision (Replaces Issue of November 1961)
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OLI 3787

PUBLISHED IN CONFORMITY WITH

GENERAL STATUTES OF NORTH CAROLINA (130-11)

THRESHOLD LIMIT VALUES FOR 1962

Adopted at the 24th Annual Meeting of the American

Conference of Governmental Industrial Hygienists

Washington, D. C., May 13-15, 1962

Threshold limits should be used as guides in the control of health hazards and should not be regarded as fine lines between safe and dangerous concentrations. They represent conditions under which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse effect. The values listed refer to time-weighted average concentrations for a normal workday. The amount by which these figures may be exceeded for short periods without injury to health depends upon a number of factors such as the nature of the contaminant, whether very high concentrations even for short periods produce acute poisoning, whether the effects are cumulative, the frequency with which high concentrations occur, and the duration of such periods. All must be taken into consideration in arriving at a decision as to whether a hazardous situation exists. Special consideration should be given to the application of these values in assessing the health hazards which may be associated with exposure to combinations of two or more substances.

Threshold limits are based on the best available information from industrial experience, from experimental studies, and, when possible, from a combination of the two.* These values are based on various criteria of toxic effects or on marked discomfort; thus, they should not be used as a common denominator of toxicity, nor should they be considered as the sole criterion in proving or disproving diagnosis of suspected occupational disease.

These limits are intended for use in the field of industrial hygiene and should be employed by persons trained in this field. They are not intended for use, or for modification for use, (1) as a relative index of toxicity, by making a ratio of two limits, or (2) in the evaluation or control of community air pollution or air pollution nuisances.

These values are reviewed annually by the Committee on Threshold Limits for changes, revisions, or additions as further information becomes available. The Committee welcomes the suggestion of substances to be added to the list and also comments, references, or reports of experience with these materials.

*"Documentation of Threshold Limit Values" is a compilation by the Committee on Threshold Limit Values of the best available technical evidence substantiating these VALUES. It can be purchased from the Secretary-Treasurer, American Conference of Governmental Industrial Hygienists, 1014 Broadway, Cincinnati 2, Ohio, price $4.00.

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RECOMMENDED VALUES

(In Alphabetical Order)

Substance	ppm+	Mg/M^3‡
Acetaldehyde	200	360
Acetic acid	10	25
Acetic anhydride	5	20
Acetone	1,000	2,400
Acetonitrile	40	70
Acetylene tetrabromide	1	14
Acrolein	0.5	1.2
Acrylonitrile - Skin	20	45
Aldrin (1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-dimethano-napthalene) - Skin	---	0.25
Allyl alcohol - Skin	2	5
Allyl chloride	5	15
Allyl glycidyl ether (AGE)	10	45
Allyl propyl disulfide	2	12
Ammonia	100	70
Ammonium sulfamate (Ammate)	---	15
Amyl acetate	200	1,050
Amyl alcohol (isoamyl alcohol)	100	360
Aniline - Skin	5	19
Antimony	---	0.5
ANTU (alpha-naphthyl-thiourea)	---	0.3
Arsenic	---	0.5
Arsine	0.05	0.2
Barium (soluble compounds)	---	0.5
Benzene (benzol)	25	80
Benzyl chloride	1	5
Beryllium	---	0.002
Boron oxide	---	15
Boron trifluoride	1	3
Bromine	0.1	0.7
Butadiene (1,3-butadiene)	1,000	2,200
2-Butanone (methyl ethyl ketone)	200	590
2-Butoxy ethanol (Butyl Cellosolve)	50	240
Butyl acetate (n-butyl acetate)	200	950
Butyl alcohol	100	300
tert. Butyl alcohol	100	300
Butylamine	5	15
n-Butyl glycidyl ether (BGE)	50	270
Butyl mercaptan	10	35
p-tert. Butyltoluene	10	60
Cadmium oxide fume	---	0.1
*Calcium arsenate	---	1

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Note: The word "Skin" following a substance indicates that the liquid can penetrate the skin to contribute to the exposure.

Substance	ppm+	Mg/M^3++
Carbon dioxide	5,000	9,000
Carbon disulfide - Skin	20	60
Carbon monoxide	100	110
*Carbon tetrachloride - Skin	10	65
Chlordane (1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene)	---	0.5
Chlorinated camphene, 60%	---	0.5
Chlorinated diphenyl oxide	---	0.5
Chlorine	1	3
Chlorine dioxide	0.1	0.3
Chlorine trifluoride	0.1	0.4
Chloroacetaldehyde	1	3
Chlorobenzene (monochlorobenzene)	75	350
Chlorodiphenyl (42% Chlorine) - Skin	---	1
Chlorodiphenyl (54% Chlorine) - Skin	---	0.5
Chloroform (trichloromethane)	50	240
1-Chloro-1-nitropropane	20	100
Chloropicrin	0.1	0.7
Chloroprene (2-chloro-1,3-butadiene)	25	90
Chromic acid and chromates (as CrO_3)	---	0.1
Crag ® herbicide (sodium 2-[2,4-dichlorophenoxy] ethanol hydrogen sulfate)	---	15
Cresol (all isomers) - Skin	5	22
Cyanide (as CN) - Skin	---	5
Cyclohexane	400	1,400
Cyclohexanol	50	200
Cyclohexanone	50	200
Cyclohexene	400	1,350
2, 4-D (2, 4-dichlorophenoxy-acetic acid)	---	10
DDT (2, 2-bis [p-chlorophenyl]- 1, 1,1-trichloroethane) Skin	---	1
Decaborane - Skin	0.05	0.3
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	50	240
Diborane	0.1	0.1
*1,2-Dibromoethane (Ethylene dibromide)	25	190
o-Dichlorobenzene	50	300
p-Dichlorobenzene	75	450
Dichlorodifluoromethane	1,000	4,950
1, 1-Dichloroethane	100	400
*1, 2-Dichloroethane (ethylene dichloride)	50	200
1, 2-Dichloroethylene	200	790
Dichloroethyl ether	15	90
Dichloromonofluoromethane	1,000	4,200
1, 1-Dichloro-1-nitroethane	10	60
Dichlorotetrafluoroethane	1,000	7,000
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) - Skin	---	0.25
Diethylamine	25	75
Difluorodibromomethane	100	860

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Substance	ppm+	Mg/M^{3}++
Diglycidyl ether (DGE)	10	55
Diisobutyl ketone	50	290
Dimethylaniline (N-dimethylaniline) - Skin	5	25
Dimethylformamide	20	60
1, 1-Dimethylhydrazine - Skin	0.5	1
Dimethylsulfate - Skin	1	5
Dinitrobenzene - Skin	---	1
Dinitrotoluene - Skin	---	1.5
Dinitro-o-cresol - Skin	---	0.2
Dioxane (diethylene dioxide)	100	360
Dipropylene glycol methyl ether	100	600
EPN (O-ethyl O-p-nitrophenyl thionobenzenephosphonate) - Skin	---	0.5
Ethyl acetate	400	1,400
Ethyl acrylate - Skin	25	100
Ethyl alcohol (ethanol)	1,000	1,900
Ethylamine	25	45
Ethylbenzene	200	870
Ethyl bromide	200	890
Ethyl chloride	1,000	2,600
Ethyl ether	400	1,200
Ethyl formate	100	300
Ethyl mercaptan	250	640
Ethyl silicate	100	850
Ethylene chlorohydrin - Skin	5	16
Ethylenediamine	10	30
*Ethylene glycol dinitrate - Skin	0.2	1.2
Ethylene imine - Skin	5	9
Ethylene oxide	50	90
2-Ethoxyethanol (Cellosolve)	200	740
2-Ethoxyethylacetate (Cellosolve Acetate)	100	540
Ferbam (ferric dimethyl dithiocarbamate)	---	15
Ferrovanadium dust	---	1
Fluoride	---	2.5
Fluorine	0.1	0.2
Fluorotrichloromethane	1,000	5,600
Formaldehyde	5	6
Furfural	5	20
Furfuryl alcohol	50	200
Gasoline	500	2,000
Glycidol (2,3-epoxy-1-Propanol)	50	150
Heptane (n-heptane)	500	2,000
Hexane (n-hexane)	500	1,800
Hexanone (methyl butyl ketone)	100	410
sec-Hexyl acetate	100	590
Hexone (methyl isobutyl ketone)	100	410
Hydrazine - Skin	1	1.3
Hydrogen bromide	3	10
Hydrogen chloride	5	7
Hydrogen cyanide - Skin	10	11

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Substance	ppm+	Mg/M^{3+}
Hydrogen fluoride	3	2
Hydrogen peroxide, 90%	1	1.4
Hydrogen selenide	0.05	0.2
Hydrogen sulfide	20	30
Hydroquinone	---	2
Iodine	0.1	1
Iron oxide fume	---	15
Isophorone	25	140
Isopropylamine	5	12
Isopropyl glycidyl ether (IGE)	50	240
Lead	---	0.2
Lead arsenate	---	0.15
Lindane (hexachlorocyclohexane, gamma isomer)	---	0.5
Lithium hydride	---	0.025
Magnesium oxide fume	---	15
Malathion (O,O-dimethyl dithiophosphate of diethyl mercaptosuccinate) - Skin	---	15
Manganese	---	5
Mercury	---	0.1
Mercury (organic compounds) - Skin	---	0.01
Mesityl oxide	25	100
Methoxychlor (2,2-di-p-methoxyphenyl-1,1, 1-trichloroethane)	---	15
Methyl acetate	200	610
Methyl acetylene	1,000	1,650
Methyl acrylate - Skin	10	35
Methylal (dimethoxymethane)	1,000	3,100
Methyl alcohol (methanol)	200	260
Methyl bromide - Skin	20	80
Methyl cellosolve (2-methoxyethanol)	25	80
Methyl cellosolve acetate (ethylene glycol monomethyl ether acetate)	25	120
Methyl chloride	100	210
Methyl chloroform (1,1,1-trichloroethane)	500	2,700
Methylcyclohexane	500	2,000
Methylcyclohexanol	100	470
Methylcyclohexanone	100	460
Methyl formate	100	250
Methyl isobutyl carbinol (methyl amyl alcohol)	25	100
Methyl mercaptan	50	100
a-Methyl styrene	100	480
Methylene chloride (dichloromethane)	500	1,750
Monomethyl aniline - Skin	2	9
Molybdenum		
(soluble compounds)	---	5
(insoluble compounds)	---	15
Naphtha (coal tar)	200	800
Naphtha (petroleum)	500	2,000
Nickel carbonyl	0.001	0.007
Nicotine - Skin	---	0.5

*1962 Revision

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Substance	ppm+	Mg/M^3‡
Nitric acid	10	25
p-Nitroaniline - Skin	1	6
Nitrobenzene - Skin	1	5
Nitroethane	100	310
Nitrogen dioxide	5	9
*Nitroglycerin - Skin	0.2	2
Nitromethane	100	250
2-Nitropropane	25	90
Nitrotoluene - Skin	5	30
Octane	500	2,350
Ozone	0.1	0.2
Parathion (O, O,diethyl-O-p-nitrophenyl thiophosphate) - Skin	---	0.1
Pentachloronaphthalene - Skin	---	0.5
Pentachlorophenol - Skin	---	0.5
Pentanone (methyl propyl ketone)	200	700
Pentene	1,000	2,950
Perchloroethylene (tetrachloroethylene)	100	670
Perchloromethyl mercaptan	0.1	0.8
Phenol - Skin	5	19
Phenyl glycidyl ether (PGE)	50	310
Phenylhydrazine - Skin	5	22
Phosgene (carbonyl chloride)	1	4
Phosphine	0.05	0.07
Phosphoric acid	---	1
Phosphorus (yellow)	---	0.1
Phosphorus pentachloride	---	1
Phosphorus pentasulfide	---	1
Phosphorus trichloride	0.5	3
Picric acid - Skin	---	0.1
Propyl acetate	200	840
Propyl alcohol (isopropyl alcohol)	400	980
Propyl ether (isopropyl ether)	500	2,100
n-Propyl nitrate	25	110
Propylene dichloride (1,2-dichloropropane)	75	350
Propylene imine - Skin	25	60
Propylene oxide	100	240
*Pyrethrum	---	5
Pyridine	5	15
Quinone	0.1	0.4
Rotenone (commercial)	---	5
Selenium compounds (as Se)	---	0.1
*Sodium fluoroacetate (1080) - Skin	---	0.05
Sodium hydroxide	---	2
Stibine	0.1	0.5
Stoddard solvent	500	2,900
Strychnine	---	0.15

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*1962 Revision

Substance	ppm+	Mg/M$^{3+}_{+}$
Styrene monomer (phenylethylene)	100	420
Sulfur dioxide	5	13
Sulfur hexafluoride	1,000	6,000
Sulfuric acid	---	1
Sulfur monochloride	1	6
Sulfur pentafluoride	0.025	0.25
TEDP (tetraethyl dithionopyrophosphate) - Skin	---	0.2
TEPP (tetraethyl pyrophosphate) - Skin	---	0.05
Tellurium	---	0.1
1,1,2,2-Tetrachloroethane - Skin	5	35
Tetrahydrofuran	200	590
Tetranitromethane	1	8
Tetryl (2,4,6-trinitrophenylmethylnitramine) - Skin	---	1.5
Thallium (soluble compounds)	---	0.1
Thiram (tetramethyl thiuram disulfide)	---	5
Titanium dioxide	---	15
Toluene (toluol)	200	750
o-Toluidine - Skin	5	22
Tolylene-2, 4-diisocyanate	0.02	0.14
Trichloroethylene	100	520
Trichloronaphthalene - Skin	---	5
*1,1,2-Trichloro 1,2, 2-trifluoroethane	1,000	7,600
Triethylamine	25	100
Trifluoromonobromomethane	1,000	6,100
Trinitrotoluene - Skin	---	1.5
Triorthocresyl phosphate	---	0.1
Triphenyl phosphate	---	3
Turpentine	100	560
Uranium		
(soluble compounds)	---	0.05
(insoluble compounds)	---	0.25
Vanadium		
(V_2O_5 dust)	---	0.5
(V_2O_5 fume)	---	0.1
Vinyl chloride (chloroethylene)	500	1,300
Vinyl toluene	100	480
*Warfarin (3-[a-acetonylbenzyl]-4-hydroxycoumarin)	---	0.1
Yttrium	---	5
Xylene (xylol)	200	870
Xylidine - Skin	5	25
*Zinc oxide fume	---	5
Zirconium compounds (as Zr)	---	5

*1962 Revision

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Radioactivity: For permissible concentrations of radioisotopes in air, see U. S. Department of Commerce, National Bureau of Standards, Handbook 69, "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure", June 5, 1959. Also, see U. S. Department of Commerce, National Bureau of Standards, Handbook 59, "Permissible Dose from External Sources of Ionizing Radiation", September 24, 1954, and addendum of April 15, 1958,

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*1962 Revision

+Parts of vapor or gas per million parts of air by volume at 25°C and 760 mm. Hg pressure.

‡Approximate milligrams of particulate per cubic meter of air.

MINERAL DUSTS

Substance	m.p.p.c.f.§
*SILICA	
Crystalline	
Quartz, Threshold Limit calculated from the formula	$\frac{250}{\%SiO_2+5}$
Cristobalite " "	
Amorphous, including natural diatomaceous earth	20
SILICATES (less than 1% crystalline silica)	
Asbestos	5
Mica	20
Soapstone	20
Talc	20
Portland Cement	50
Miscellaneous (less than 1% crystalline silica)	50

Note: The percent of crystalline silica in the above formula and tables is based on the amount found from an analysis of the air-borne dust.

Conversion factors
mppcf x 35.3 = million particles per cubic meter
= particles per c.c.

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§ Millions of particles per cubic foot of air, based on the standard procedure for sampling and counting dusts adopted by the Fifth Annual Meeting of ACGIH (1942).

*1962 Revision

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TENTATIVE VALUES

Substance	ppm+	Approx. Mg. per Cu. M.‡
*Benzidine	---	A[1]
tert. Butyl chromate (as CrO_3)	---	0.1
*Camphor	---	5
Chlorobromomethane	200	1,050
*Cobalt	---	0.5
DDVP (0,0-Dimethyl-2,2-dichlorovinyl phosphate)	---	1
Dimethyl acetamide - Skin	10	35
Endrin (1,2,3,4,10,10-hexachloro-6, 7-epoxy-1,4,4a, 5,6,7,8, 8a-octa hydro 1,4-endo-5, 8-dimethanonaphthalene)	---	0.25
*Epichlorohydrin	5	19
Ethanolamine	0.5	1
Heptachloro (1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene)	---	0.25
Ketene	0.5	0.9
*B-Naphthylamine	---	A[2]
1-Nitropropane	25	90
*N-Nitrosodimethylamine (Dimethylnitrosamine)	A[3]	---
*Oil (mineral)	---	5
*Osmium tetroxide	---	0.002
Pentaborane	0.005	0.01
*Perchloryl fluoride	3	13.5
Phosdrin (2-carbomethoxy-1-methyl vinyl dimethyl phosphate)	---	0.1
*Platinum compounds (as Pt.)	---	0.002
*Sulfuryl fluoride	5	20
Systox	---	0.2
2,4,5T (2,4,5-Trichlorophenoxyacetic acid)	---	10
Teflon ® decomposition products	---	A[4]
1,3,3-Trichloropropane	50	300

+ Parts of vapor or gas per million parts of air by volume at 25°C and 760 mm. Hg. pressure.

‡ Approximate milligrams per cubic meter of air.

*1962 addition. A numbers, see Appendix

APPENDIX

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

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

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Appendix (Continued)

A^3 N-Nitrosodimethylamine. Because of extremely high toxicity and presumed carcinogenic potential of this compound, contact by all routes should not be permitted.

A^4 Teflon® decomposition products. At least one identified component of Teflon® decomposition products is extremely toxic, but, in the absence of more complete toxicity information and suitable analytical methods, a definite threshold limit value is not recommended at this time.

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OLI 3798

File - Threshold Limit Values

NOTICE OF INTENDED CHANGES
for 1975
REVISIONS
(Excluding substances or operations with carcinogenic potential)
(for which, see Appendix A)

SUBSTANCE	FROM 1974 TLV	TO PROPOSED 1975 LIST
Cobalt, metal fume & dust	0.1 mg/m^3	0.01 mg/m^3
2-Hexanone (Methyl butyl ketone)	100 ppm	25 ppm
Methylene chloride	100 ppm	200 ppm
Nickel carbonyl	0.001 ppm Ala	0.1 ppm
Phthalic anhydride	2 ppm	1 ppm
Silica, amorphous	(see Mineral Dusts)	

NEW ADDITIONS
(Excluding Substances or Operations with Carcinogenic Potential)
(see Appendix A)

SUBSTANCE	PROPOSED LIMIT
Antimony trioxide, handling & use	0.5 mg/m^3 as Sb
Arsenic trioxide, handling & use	0.25 mg/m^3 as As
Borates-tetra, sodium salts	
Anhydrous	1 mg/m^3
Pentahydrate	5 mg/m^3
Decahydrate	5 mg/m^3
Captafol (Difolatan®) - Skin	0.1 mg/m^3
Cyanamide	2 mg/m^3
Dioxathion (Delnav®) - Skin	0.2 mg/m^3
Dicrotophos (Bidrin®) - Skin	0.25 mg/m^3
Endosulfan (Thiodan®)	0.1 mg/m^3
Ethion (Nialate®) - Skin	0.4 mg/m^3
Isophorone diisocyanate - Skin	0.01 ppm
Methomyl (Lannate®, Nudrin®) - Skin	2.5 mg/m^3
Monocrotophos (Azodrin®)	0.25 mg/m^3
m-Phthalodinitrile	5.0 mg/m^3
1,2-Propylene glycol dinitrate - Skin	C 0.05 ppm
Rubber Solvent	400 ppm
1,2,4-Trichlorobenzene	C 5 ppm
VM&P Naphtha	200 ppm
Vinyl cyclohexene dioxide	10 ppm

MINERAL DUSTS

SUBSTANCE	FROM 1974 TLV	TO PROPOSED 1975 LIST
Silica, amorphous, (including Diatomaceous earth)	20 mppcf	3 mg/m^3 Total dust (all sampled sizes) 1 mg/m^3 Respirable dust (< 5 μm)

OLI 3799

NOTICE OF INTENDED CHANGES

APPENDIX A

CARCINOGENS

The Committee lists below those substances in occupational use that have proven carcinogenic in man, or have induced cancer in animals under appropriate experimental conditions. Present listing of those substances carcinogenic for man takes three forms, those for which a TLV has been assigned (1a), those for which environmental conditions have not been sufficiently defined to assign a TLV (1b), and 1c, those whose reassignment of a TLV is awaiting more definitive data, and hence should be treated as a 1b carcinogen.

1a. Human Carcinogens. Substances, or substances associated with occupational processes, recognized to have carcinogenic or cocarcinogenic potential, with an assigned TLV.

	TLV
Arsenic trioxide production	As_2O_3, 0.05 mg/m^3 as As SO_2, C 5.0 ppm Sb_2O_3, 0.05 mg/m^3 as Sb
Asbestos, all forms*	5 fibers/cc, < 5μ in length
Cadmium oxide production	0.05 mg/m^3 as Cd
bis (chloromethyl) ether	1.0 ppb
Chromite ore processing	0.1 mg/m^3 as CrO_3
Particulate Polycyclic Organic Matter	0.2 mg/m^3, as benzene solubles

*Cigarette smoking may substantially enhance the incidence of bronchogenic carcinoma from this and others of these substances or processes.

* * *

1b. Human Carcinogens. Substances, or substances associated with industrial processes, recognized to have carcinogenic potential without an assigned TLV:

4-Aminodiphenyl (p-Xenylamine)
Benzidine production-Skin
beta-Naphthylamine
4-Nitrodiphenyl

1c. Human carcinogens. Substances with recognized carcinogenic potential awaiting reassignment of TLV pending further data acquisition:

Vinyl chloride

For the substances in 1b, no exposure or contact by any route, respiratory, skin or oral, as detected by the most sensitive methods, shall be permitted.

"No exposure or contact" means hermitizing the process or operation by the best practicable engineering methods. The worker should be properly equipped to insure virtually no contact with the carcinogen.

A2. Occupational Substances Suspect of Oncogenic Potential for Workers.

Chemical substances, or substances associated with occupational processes, which are suspected of inducing malignant neoplasms, based on either a) limited epidemiologic evidence, exclusive of clinical reports of single cases, or b) demonstration of malignant growths in one or more animal species by appropriate methods.

Present evidence indicates that the assigned TLVs are below the threshold of response for inducing cancer in workers under ordinary conditions of employment.

For those substances without an assigned TLV, exposure by all routes should be carefully controlled to levels consistent with the animal and human experience data (see Documentation).

Substance or Operation	TLV
Antimony trioxide production*[a)]	0.05 mg/m^3
Benzene[a)]	10 ppm
Benzo(a)pyrene[b)]-Skin	
Beryllium[a)b)]	2.0 $\mu g/m^3$
3,3' Dichlorobenzidine[b)]-Skin	
Dimethyl sulfate[b)]	C 1.0 mg/m^3
Hydrazine[b)]-Skin	0.1 ppm
4,4'-Methylene bis(2-chloroaniline)[b] --Skin	0.02 ppm
Nickel production (Ni_2S_3)[a)b)]	
Nitrosamines (Dimethyl nitrosamine)[b]	
Propane sultone[b)]	
beta-Propiolactone[b)]	
Zinc Chromate[a)]	0.1 mg/m^3 as CrO_3

Letters in parentheses refer to kinds of informational bases qualifying the substance or operation to be included in A2. (See Documentation)

ANNUAL REPORT, TLV COMMITTEE

June 1975

OCCUPATIONAL SUBSTANCES UNDER SURVEILLANCE BY
TLV SUBCOMMITTEE FOR ONCOGENIC POTENTIAL FOR WORKERS

The substances listed below, although not presently qualifying for an A-2 listing, are being kept under continuing review by the TLV Subcommittee:

Chloroform
Chloroprene
Dieldrin-Aldrin
1,1-Dimethyl hydrazine
Dioxane
Epichlorohydrin
Ethylenimine
Lead chromate
Methyl methacrylate
Monomethyl hydrazine
o-Toluidine
Trichloroethylene
Vinylcyclohexene dioxide

OLI 3802

NOTICE OF INTENDED CHANGES
(for ~~1976~~)
1975

These physicial agents, with their corresponding values, comprise those for which either a limit has been proposed for the first time, or for which a change in the "adopted" listing has been proposed. In both cases, the proposed limits should be considered trial limits that will remain in the listing for a period of at least one year. If, after one year, no evidence comes to light that questions the appropriateness of the values herein, the values will be reconsidered for the "adopted" list.

NOTICE OF INTENT TO ESTABLISH
THRESHOLD LIMIT VALUES

LIGHT

These Threshold Limit Values refer to visible radiation in the wavelength range of 400 nm to 700 nm and represent conditions under which it is believed that nearly all workers may be exposed without adverse effect.

These values should be used as guides in the control of exposure to light and should not be regarded as a fine line between safe and dangerous levels.

Recommended Values.

The Threshold Limit Value for occupational exposure to light where luminances are known and exposure durations exceeding 10 seconds in any eight hour workday is as follows:

1. The average luminance of objects continuously viewed shall not exceed 1 candela cm^{-2}. ~~2~~ fc approx. equiv.

This TLV is not to be used for short exposure durations or pulsed light sources.

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These Threshold Limit Values refer to sound pressure levels and durations of exposure that represent conditions under which it is believed that nearly all workers may be repeatedly exposed without adverse effect on their ability to hear and understand normal speech. The medical profession has defined hearing impairment as an average hearing threshold level in excess of 25 decibels (ANSI-S3.6-1969) at 500, 1000, and 2,000 H_z, and the limits which are given have been established to prevent a hearing loss in excess of this level. The values should be used as guides in the control of noise exposure and, due to individual susceptibility, should not be regarded as fine lines between safe and dangerous levels.

IMPULSIVE OR IMPACT NOISE

It is recommended that exposure to impuslive or impact noise should not exceed those listed in Table II. Impulsive or impact noise is considered to be those variations in noise levels that involve maxima at intervals of greater than one per second. Where the intervals are less than one second, it should be considered continuous.

TABLE II
THRESHOLD LIMIT VALUES
IMPULSIVE OR IMPACT NOISE

Sound Level dB*	Number of Impulses or Impacts per day
140	100
130	1000
120	10000

*decibels peak sound pressure level

NOTICE OF INTENT TO CHANGE
TLV for LASERS

TLV's for Lasers would be changed for ocular exposure to visible and IR-A laser radiation for durations greater than 10 s. Also to be changed would be TLV's for skin exposure to IR-A laser radiation. All other laser TLV's would remain unchanged. The sections of Tables 3, 4, and 6 that would have changes are as follows:

Table 3 Changes

Threshold Limit Values for Direct Ocular Exposures (Intrabeam Viewing) from a Laser Beam

Spectral Region	Wavelengths	Exposure Duration (t) in Seconds	TLV
Light	400 nm to 700 nm	10^{-9} to 1.8×10^{-5}	5×10^{-7} J·cm^{-2}
	400 nm to 700 nm	1.8×10^{-5} to 10	$1.8\left(t/\sqrt[4]{t}\right)$ mJ·cm^{-2}
	400 nm to 550 nm	10 to 10^{4}	10 mJ·cm^{-2}
	550 nm to 700 nm	10 to T_1	$1.8\left(t/\sqrt[4]{t}\right)$ mJ·cm^{-2}
	550 nm to 700 nm	T_1 to 10^{4}	10 C_B mJ·cm^{-2}
	400 nm to 700 nm	10^{4} to 3×10^{4}	C_B µW·cm^{-2}
IR-A	700 nm to 1059 nm	10^{-9} to 1.8×10^{-5}	5 $C_A \times 10^{-7}$ J·cm^{-2}
	700 nm to 1059 nm	1.8×10^{-5} to 10^{3}	$1.8\ C_A\left(t/\sqrt[4]{t}\right)$ mJ·cm^{-2}
	1060 nm to 1400 nm	10^{-9} to 10^{-4}	5×10^{-6} J·cm^{-2}
	1060 nm to 1400 nm	10^{-4} to 10^{3}	$9\left(t/\sqrt[4]{t}\right)$ mJ·cm^{-2}
	700 nm to 1400 nm	10^{3} to 3×10^{4}	320 C_A µW·cm^{-2}

C_A - See Fig 2 of Permanent TLV listing for lasers.

$C_B = 1$ for $\lambda \leq$ 400 nm to 550 nm; $C_B = 10^{[0.015(\lambda - 550\ \text{nm})]}$ for λ = 550-700 nm.

T_1 = 10 s for λ = 400-550 nm; $T_1 = 10 \times 10^{[0.02(\lambda - 550)]}$ for λ = 550 nm to 700 nm.

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Table 4 Changes

Threshold Limit Values for Viewing a Diffuse Reflection of a Laser Beam or an Extended Source Laser

Spectral Region	Wavelengths	Exposure Duration (t) in Seconds	TLV
Light	400 nm to 700 nm	10^{-9} to 10	$10\sqrt[3]{t}$ J·cm^{-2}·sr^{-1}
	400 nm to 550 nm	10 to 10^4	21 J·cm^{-2}·sr^{-1}
	550 nm to 700 nm	10 to T_1	$3.83\left(t/\sqrt[4]{t}\right)$ J·cm^{-2}·sr^{-1}
	550 nm to 700 nm	T_1 to 10^4	2 C_B X 10^{-3} W·cm^{-2}·sr^{-1}
	400 nm to 700 nm	10^4 to 3 X 10^4	2 C_B X 10^{-3} W·cm^{-2}·sr^{-1}
IR-A	700 nm to 1400 nm	10^{-9} to 10	10 $C_A\sqrt[3]{t}$ J·cm^{-2}·sr^{-1}
	700 nm to 1400 nm	10 to 10^3	$3.83\ C_A\left(t/\sqrt[4]{t}\right)$ J·cm^{-2}·sr^{-1}
	700 nm to 1400 nm	10^3 to 3 X 10^4	0.64 C_A W·cm^{-2}·sr^{-1}

C_A , C_B , and T_1 are the same as in footnote to Table 3

Table 6 Changes

Spectral Region	Wavelengths	Exposure Duration (t) in Seconds	TLV
Light & IR-A	400 nm to 1400 nm	10^{-9} to 10^{-7}	2 C_A X 10^{-2} J·cm^{-2}
	" "	10^{-7} to 10	1.1 $C_A\sqrt[4]{t}$ J·cm^{-2}
	" "	10 to 3 X 10^4	0.2 C_A W·cm^{-2}

C_A = 1.0 for λ = 400-700 nm; see Figure 2 of Permanent TLV list for greater wavelength values.

NOTICE OF INTENT TO STUDY

These agents comprise those which the Physical Agents Committee of ACGIH proposes to study during this year to determine the feasibility of establishing proposed TLV's in 1976. Comments and suggestions, accompanied by substantitive evidence, are solicited.

Radiofrequency Radiation. Specifically, that of the spectrum from 10 MHz to 100 MHz.

Ultrasonic Energy. Specifically, accoustic energy at frequencies above 10 kHz.

Magnetic Fields. Both Pulsed and Contiuous.

Microwave Radiation. Specifically from 100 GHz to 300 GHz.

Laser Radiation. Specifically ultraviolet radiation ~~xxxxx~~ for pulsed exposures, and repetitively pulsed Light and IR-A laser exposures.