

DOCUMENTATION OF THRESHOLD LIMIT VALUES



**AMERICAN CONFERENCE OF
GOVERNMENTAL INDUSTRIAL HYGIENISTS**

COMMITTEE ON THRESHOLD LIMIT VALUES

OLI 3808

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Copies of this publication may be obtained from:

Secretary-Treasurer
American Conference of Governmental Industrial Hygienists
1014 Broadway
Cincinnati 2, Ohio

Price per copy \$4.00

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Industrial Hygienists

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PREFACE

The documented evidence appearing in this publication has been taken mainly from technical papers and texts of industrial hygiene and toxicology that have appeared over the years and from the experience and knowledge of committee members. All informational sources are referenced. Occasionally, written communications to the committee members have been used to supplement formally published material, when such information has been substantiated by valid observation. It is this material that has been used in deriving the values given in the table of threshold limits which is published annually by the American Conference of Governmental Industrial Hygienists.

The format is designed to supply in brief the best available technical evidence substantiating the choice of the limiting concentrations. Substances are listed in alphabetical order for ready reference. The evidence on individual substances in this compilation is not necessarily final. The format facilitates the supplementation or modification of existing data, or the addition of information on new substances as it becomes available.

The committee urges careful study and review of this publication and welcomes suggestions or new data that will maintain the usefulness of this publication. Supplements will be published and offered for sale as new information justifies their appearance.

Communications should be addressed to the Chairman of the committee, Dr. H.E. Stokinger, or to the Secretary-Treasurer of the ACGIH, 1014 Broadway, Cincinnati 2, Ohio.

recommended limit of Roshchin. More recently Lewis (3) has reported no toxic manifestations from vanadium dusts, that included the pentoxide, among workmen exposed to concentrations of from 0.1-0.3 mgV/m³.

The lower limit of 0.1 mg/m³ for vanadium pentoxide fume is based on the recognizedly greater toxicity of fume, compared with dusts of larger size and smaller surface area.

References

1. Roshchin, I.V.: Gig. i Sanit. 11, 49 (1953).
2. Stokinger, H.E., Wagner, W.D., et al. To be published.
3. Lewis, C.E.: Arch. Ind. Health 19, 497 (1959).

VINYL CHLORIDE (CHLOROETHYLENE)

500 ppm (Approximately 1300 mg/m³)

Patty and associates (1) found that guinea pigs inhaling 5000 ppm of vinyl chloride for several hours appeared to suffer no ill effects. Narcosis is the most important effect from inhaling this compound.

The 500 ppm threshold limit appears to be sufficiently low to prevent significant narcosis.

Reference

1. Patty, F.A., Yant, W.F., White, C.P.: Pub. Health Rept. 45, 1963 (1930).

VINYLTOLUENE

100 ppm (Approximately 480 mg/m³)

This compound is a mixture of the meta and para isomers of methylstyrene. Rats, guinea pigs, rabbits, mice, and monkeys tolerated vapor concentrations of 600 ppm of vinyltoluene given repeated exposures 7 hours a day, 5 days a week for periods ranging from 4 to 5 months. The animals were normal as judged by growth, mortality, hematology, organ weight, gross and microscopic examination of the tissues, blood urea nitrogen values, and qualitative urine tests.

Thus, vinyltoluene is similar in toxicologic properties to monomeric styrene. Like styrene, concentrations of the order of 600 ppm are extremely disagreeable to human subjects. The authors recommended a threshold limit value of 400 ppm based on toxicity, but suggest that atmospheric contamination be maintained at 100 ppm or less in order to avoid discomfort.

Reference

1. Biochemical Dept., Dow Chem. Co., Midland, Mich., unpublished summary.

WARFARIN (3-(α -acetylbenzyl)-4, hydroxycoumarin)

0.5 mg/m³

This rodenticide is the prototype of the anticoagulants. Lehman (1) has reported its acute oral toxicity as 160 mg/kg for rats. Its hazard is its cumulative effect and for this reason the threshold limit should be lower than the acute LD₅₀ would suggest. A threshold limit of 0.5 mg/m³ is recommended.

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Reference

1. Lehman, A.J.: U.S. Food & Drug Adm. Quart. Rept., October 1951.

COMMITTEE ON THRESHOLD LIMITS
of the
AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS
1968 NOTICE OF INTENT

This Notice of Intent is published so that industry-connected individuals principally, but others also, may have an opportunity to help shape the deliberations of the Committee prior to its recommendations of tentative changes in the 1967 Threshold Limits List. This can be done by submitting to the Chairman comments on the intended changes, with supporting data, or by submitting new data on substances not within the Notice of Intent.

This Notice is not binding on the Committee to place all substances listed below in the 1968 Edition, nor does it restrict the Committee to these substances; substances with appropriate supporting data received following the publication of this list will be considered at the next Committee meeting for inclusion in the 1968 Edition. This Notice indicates only those substances that are under consideration by the Committee. Documentation is available upon request for those substances bearing a threshold limit value.

All comments should reach the Chairman by March 15, 1968. Address: Dr. Herbert E. Stokinger, U.S. Public Health Service, 1014 Broadway, Cincinnati, Ohio 45202. If preferred, information may be sent to the Repository of Anonymous Occupational Health Data, % Dr. R.T. P. de Treville, Industrial Hygiene Foundation, 4400 Fifth Ave., Pittsburgh, Pa. 15213

The following list of Proposed Revisions and Additions for the 1968 Threshold Limits List has resulted from the fall meeting of Plenary Committee

REVISIONS UNDER CONSIDERATION

Substance	From 1967 List	Proposed for 1968 List
	ppm, mg/m ³ or mppcf	ppm, mg/m ³ or mppcf
Asbestos*	5	*Appendix 7. A limit of 5 mppcf, based on impinger samples counted by light-field technics, is satisfactory to control exposures to most forms of asbestos. Crocidolite, however, has been shown to produce, in addition to the asbestotic inflammation, also mesothelioma. Since no safe limit can be established for this form of asbestos at this time, until more definitive data are obtained, it is recommended that workers exposed to crocidolite be equipped with air-supplied helmets.
Benzene	C25	10
Butyl mercaptan	10	0.5
Cristobalite*	250 mppcf	*Downward revision by a factor of 2.5?
Tridymite* % SiO ₂	5	
Ethyl mercaptan	10	0.5
Heptane	200	500
Methyl mercaptan	10	0.5
Octane	200	400

1968 Notice of Intent - Continued

Substance	From 1967 List ppm, mg/m ³ or mppcf	Proposed for 1968 List ppm, mg/m ³ or mppcf
Oil Mists*	5	5* Collected by electrostatic precipitator. If vapors involved, apply appropriate TLV
Pentane	1000	500
Petroleum distillates		A ⁶
Quartz	250 mppcf	10 mg/m ³
	% SiO ₂ +5	% Resp. free SiO ₂ **2 (alternative mass form.)
*Respirable free SiO ₂ as defined by:		
Aerodynamic Diameter (Unit density sphere)		Minimal %
micra		Collected
< 2.0		90
2.5		75
3.5		50
5.0		25
10.0		0
Stoddard solvent	500	200
Tetraethyl lead	0.075	Downward revision 2
Tetramethyl lead	0.075	" "

ADDITIONS UNDER CONSIDERATION

Substance	Proposed Limit
Dichloroacetylene	C 0.1 ppm
Endosulfan (thiodan) - skin	0.1 mg/m ³
Indene	10 ppm
Methyl isoamyl alcohol	100 ppm
Pentaerythritol	15 mg/m ³
Rosin fumes	0.2 mg/m ³

DESIRABLE SUBSTANCES FOR ADDITION, BUT FOR WHICH INADEQUATE DATA EXIST
Information pertinent to the recommendation of an industrial air limit is solicited on the following substances:

Aluminum powder	Mercaptobenzothiazole
Benzothiazyl disulfide	(Poly) vinyl chloride
Butyl lactate	Silicon tetrachloride
o-Chlorostyrene	Silicon tetrafluoride
Hexafluoroacetone	Trimethyl benzene
Hexafluoroisopropanol	Vinyl acetate

Dr. Herbert E. Stokinger,
Chairman
TLV Committee, ACGIH

November 22, 1967

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