

## POLICY STATEMENT ON THE USES OF TLVs® AND BEIs®

The Threshold Limit Values (TLVs®) and Biological Exposure Indices (BEIs®) are developed as guidelines to assist in the control of health hazards. These recommendations or guidelines are intended for use in the practice of industrial hygiene, to be interpreted and applied only by a person trained in this discipline. They are not developed for use as legal standards and ACGIH® does not advocate their use as such. However, it is recognized that in certain circumstances individuals or organizations may wish to make use of these recommendations or guidelines as a supplement to their occupational safety and health program. ACGIH® will not oppose their use in this manner, if the use of TLVs® and BEIs® in these instances will contribute to the overall improvement in worker protection. However, the user must recognize the constraints and limitations subject to their proper use and bear the responsibility for such use.

The Introductions to the TLV®/BEI® Book and the TLV®/BEI® Documentation provide the philosophical and practical bases for the uses and limitations of the TLVs® and BEIs®. To extend those uses of the TLVs® and BEIs® to include other applications, such as use without the judgment of an industrial hygienist, application to a different population, development of new exposure/recovery time models, or new effect endpoints, stretches the reliability and even viability of the database for the TLV® or BEI® as evidenced by the individual Documentation.

It is not appropriate for individuals or organizations to impose on the TLVs® or the BEIs® their concepts of what the TLVs® or BEIs® should be or how they should be applied or to transfer regulatory standards requirements to the TLVs® or BEIs®.

Approved by the ACGIH® Board of Directors on March 1, 1988.

### Special Note to User

The values listed in this book are intended for use in the practice of industrial hygiene as guidelines or recommendations to assist in the control of potential workplace health hazards and for no other use. These values are *not* fine lines between safe and dangerous concentrations and *should not* be used by anyone untrained in the discipline of industrial hygiene. It is imperative that the user of this book read the Introduction to each section and be familiar with the Documentation of the TLVs® and BEIs® before applying the recommendations contained herein. ACGIH® disclaims liability with respect to the use of the TLVs® and BEIs®.

the ACGIH® Board of Directors. The proposals should be considered trial values during the period they are on the NIC. If the Committee neither finds nor receives any substantive data that change its scientific opinion regarding an NIC TLV®, the Committee may then approve its recommendation to the ACGIH® Board of Directors for adoption. If the Committee finds or receives substantive data that change its scientific opinion regarding an NIC TLV®, the Committee may change its recommendation to the ACGIH® Board of Directors for the matter to be either retained on or withdrawn from the NIC. Values appearing in parentheses in the Adopted TLV® section are to be used during the period in which a proposed change for that value or notation appears on the NIC.

#### Particulate Matter/Particle Size

For solid and liquid particulate matter, TLVs® are expressed in terms of "total" particulate matter, except where the terms inhalable, thoracic, or respirable particulate matter are used. The intent of ACGIH® is to replace all "total" particulate TLVs® with inhalable, thoracic, or respirable particulate mass TLVs®. Side-by-side sampling using "total" and inhalable, thoracic, or respirable sampling techniques is encouraged to aid in the replacement of current "total" particulate TLVs®. See Appendix C: Particle Size-Selective Sampling Criteria for Airborne Particulate Matter, for the definitions of inhalable, thoracic, and respirable particulate matter.

#### Particles (insoluble or poorly soluble) Not Otherwise Specified (PNOS)

There are many insoluble particles of low toxicity for which no TLV® has been established. ACGIH® believes that even biologically inert, insoluble, or poorly soluble particles may have adverse effects and suggests that airborne concentrations should be kept below 3 mg/m<sup>3</sup>, respirable particles, and 10 mg/m<sup>3</sup>, inhalable particles, until such time as a TLV® is set for a particular substance. A description of the rationale for this recommendation and the criteria for substances to which it pertains are provided in Appendix B.

#### TLV® Basis

TLVs® are derived from publicly available information summarized in their respective Documentation. Although adherence to the TLV® may prevent several adverse health effects, it is not possible to list all of them in this book. The basis on which the values are established will differ from agent to agent (e.g., protection against impairment of health may be a guiding factor for some, whereas reasonable freedom from irritation, narcosis, nuisance, or other forms of stress may form the basis for others). Health impairments considered include those that shorten life expectancy, adversely affect reproductive function or developmental processes, compromise organ or tissue function, or impair the capability for resisting other toxic substances or disease processes.

The TLV® Basis represents the adverse effect(s) upon which the TLV® is based. The TLV® Basis column in this book is intended to provide a field reference for symptoms of overexposure and as a guide for determining whether components of a mixed exposure should be considered as acting independently or additively. Use of the TLV® Basis column is not a substitute for read-

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## TLVs® and BEIs®

Based on the Documentation of the

### Threshold Limit Values

for Chemical Substances and Physical Agents



### Biological Exposure Indices

## ACGIH®

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ing the Documentation. Each Documentation is a critical component for proper use of the TLV(s)® and to understand the TLV® basis. A complete list of the TLV® bases used by the Threshold Limit Values for Chemical Substances Committee may be found in their Operations Manual online at: ([www.acgih.org/tlv-bei-guidelines/policies-procedures-presentations/tlv-bei-committee-operations-manuals](http://www.acgih.org/tlv-bei-guidelines/policies-procedures-presentations/tlv-bei-committee-operations-manuals)).

#### Abbreviations used:

<i>card</i> – cardiac	<i>impair</i> – impairment
<i>CNS</i> – central nervous system	<i>inhib</i> – inhibition
<i>COHb-emia</i> – carboxyhemoglobinemia	<i>irr</i> – irritation
<i>convul</i> – convulsion	<i>LRT</i> – lower respiratory tract
<i>dam</i> – damage	<i>MeHb-emia</i> – methemoglobinemia
<i>eff</i> – effects	<i>PNS</i> – peripheral nervous system
<i>form</i> – formation	<i>pulm</i> – pulmonary
<i>func</i> – function	<i>repro</i> – reproductive
<i>GI</i> – gastrointestinal	<i>resp</i> – respiratory
<i>Hb</i> – hemoglobin	<i>sens</i> – sensitization
	<i>URT</i> – upper respiratory tract

#### Notations/Endnotes

##### Biological Exposure Indices (BEIs®)

The notation "BEI" is listed in the "Notations" column when a BEI® (or BEIs®) is (are) also recommended for the substance. Three subcategories to the "BEI" notation have been added to help the user identify those substances that would use only the BEI® for Cholinesterase inhibiting pesticides or Methemoglobin inducers. They are as follows:

BEI<sub>C</sub> = See the BEI® for Cholinesterase inhibiting pesticide

BEI<sub>M</sub> = See the BEI® for Methemoglobin inducers

BEI<sub>P</sub> = See the BEI® for Polycyclic aromatic hydrocarbons (PAHs)

Biological monitoring should be instituted for such substances to evaluate the total exposure from all sources, including dermal, ingestion, or nonoccupational. See the BEI® section in this book and the Documentation of the TLVs® and BEIs® for these substances.

##### Carcinogenicity

A carcinogen is an agent capable of inducing benign or malignant neoplasms. Evidence of carcinogenicity comes from epidemiology, toxicology, and mechanistic studies. Specific notations (i.e., A1, A2, A3, A4, and A5) are used by ACGIH® to define the categories for carcinogenicity and are listed in the Notations column. See Appendix A for these categories and definitions and their relevance to humans in occupational settings.

##### Inhalable Fraction and Vapor (IFV)

The Inhalable Fraction and Vapor (IFV) endnote is used when a material exerts sufficient vapor pressure such that it may be present in both particle and