Particle Size Selection Sampling Conventions and Conversions, Substance Selection, and Particulates Not Otherwise Specified

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Statistics

- 674 TLV®-CS substances with TWA or Ceiling
  - 191 TLVs® for D&I substances
- 2004 Actions on D&I substances:
  - 28 Under Study
  - 11 NIC (7 new)
  - 2 Adoptions (Sulfuric Acid & Hydrogen Bromide)

2004 D&I Under Study

Old "PNOS" Substances:

- Aluminum oxide
- Calcium carbonate
- Calcium silicate
- Calcium sulfate
- Emery
- Ferbam
- Magnesite
- Perlite
- Portland cement
- Silica, amorphous
- Silicon
- Vegetable oil mists

Other Substances:

- Aluminum & Compounds
- Alpha-Amylase
- Carbon black
- Diesel Exhaust
- Iron oxide
- Manganese
- Metal working fluids
- Nickel carbonyl
- Nitrogen trifluoride
- PVC dust
- Subtilisins
- Thallium & Soluble Compounds
- Vanadium Pentoxide

Particulates (Insoluble or Poorly Soluble) Not Otherwise Specified

- Historical overview (nuisance dusts)
- New Appendix B
  - Insoluble or poorly soluble materials
  - No applicable TLV®
  - Low toxicity
- No TLV® listing
- Committee is currently reviewing "old" PNOS substances

PNOS Substances Under Study

- Reviewing literature and past TLV® *Documentation*
- Possible directions:
  - Recommend TLV® for substance (not PNOS)
  - Recommend PNOS level
    - List in Appendix B or publish separate doc?
  - Withdraw and recommend no level
    - List in Appendix B (not a PNOS)?
    - List in separate Appendix (not enough information)?

Chemical Selection

- Differences between D&I and other substances
  - Many dusts are generated by processes, not products
  - Many aerosols are complex mixtures (chemically and physically)
  - Limited understanding of respiratory toxicology

Particle Size Selective TLVs®

- Three particle size selective sampling conventions
  - Inhalable (18 adopted TLVs®)
  - Thoracic (1 adopted TLV®)
  - Respirable (22 adopted TLVs®)
- Sampling convention depends on:
  - Particle size distribution
  - Health effects

TLV®/BEI® Book

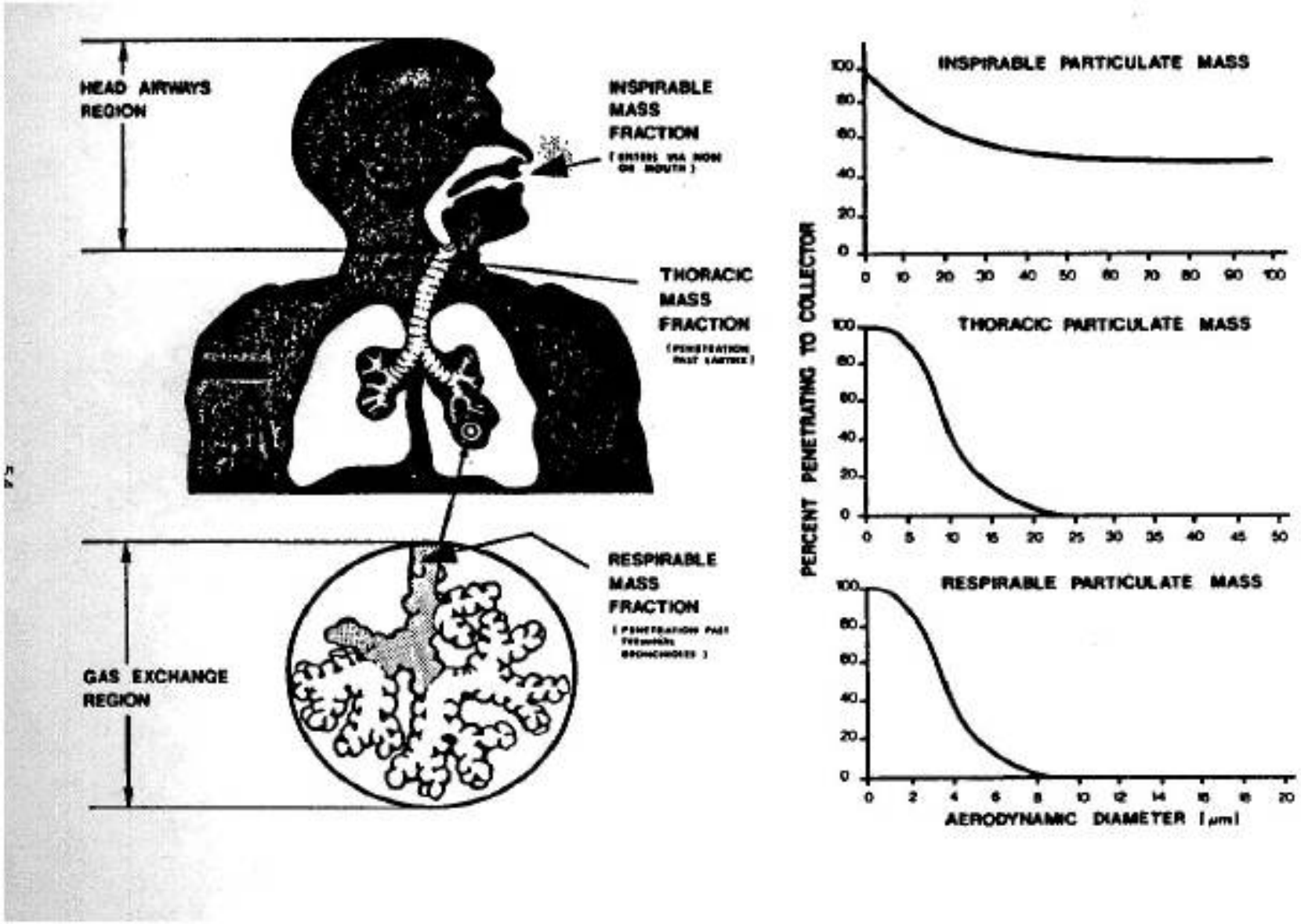
- For solid and liquid particulate matter, TLVs® are expressed in terms of "total" particulate, except where the term inhalable, thoracic or respirable particulate mass is used.

- The intent of the TLVs® for Chemical Substances Committee is to replace all "total" particulate TLVs® with inhalable, thoracic or respirable particulate mass TLVs®.

What is Size Selective Sampling?

Health hazards of many aerosols depend on particle size and amount deposited in respiratory tract.

- Inhalable TLVs®
  - Health effects associated with deposition *anywhere in respiratory tract*
- Thoracic TLVs®
  - Health effects associated with deposition *in lung airways and gas-exchange region*
- Respirable TLVs®
  - Health effects associated with deposition *in gas-exchange region*



Phalen RF: Introduction and recommendations. In: ParticleSize-Selective Sampling in the Workplace. American Conference of Governmental Industrial Hygienists, Cincinnati, OH (1984).

Setting Size-Selective TLVs®

- New TLVs® follow this procedure:
  - Each material is evaluated separately for health effects and conversions
  - If side-by-side studies are available, these conversions are used
  - If not, the aerosol size distribution and a generic table of conversions are employed

Generic Table of Conversions

Suggested working conversion factors (S values) for use where it is deemed desirable to adjust exposure data to account for the change in exposure assessment rationale (based on generalization of results of comparisons between 'total' aerosols as measured using the 37mm sampler and inhalable aerosol as measured using the IOM sampler)

Aerosol classification/industrial category	Suggested Conversion Factor
Dust – **Mining, Ore and rock handling, Handling/transportation of bulk aggregates, Textiles, Flour and grain handling, etc.**	**2.5**
Mist - **Oil mist and other machining fluids, Paint sprays, Electroplating, etc.**	**2.0**
Hot processes – **Metal smelting and refining, Foundries, etc.**	**1.5**
Welding – **All**	**1.0**
Smoke and fumes – **All**	**1.0**

Source: Werner, MA, Spear TM, and Vincent JH (1996). Investigation into the impact of introducing workplace aerosol standards based on the inhalable fraction, The Analyst, 121, pp. 1207-1214.

Enzyme Symposium

- Symposia Goals
  - New and on-going research
  - Published abstracts
- Past Symposia
  - Beryllium, Oil Mist and Metal Working Fluids, Toluene Diisocyanate
- Enzyme Symposium (Subtilisins, alpha-Amylase, etc.)
  - *September 29-30, 2004, Cincinnati, OH*
  - *Registration: Before 8/27/04*
  - *$495 ACGIH® Member*
  - *$595 non-Member*
  - *$695 Membership+Symposium*
  - *+ $100 After 8/27/04*
  - *+ $200 On Site*

General Committee Activities

- *Documentation* template
- Chemical substance selection
- Outreach
- Committee Composition / Disciplines
  - Occupational Physicians
  - Epidemiologists
  - Toxicologists
  - Industrial Hygienists
- Literature searching
- Scientific issues of interest
  - Neurologic end points (e.g. ocular, ototoxic effects of solvents)
  - Reproductive end points

How To Keep Up With New TLVs®?

- Review TLV®/BEI® Book every year:
  - Notice of Intended Changes
  - Substances and Issues Under Study
  - Introduction and Appendices
- Request *Documentation* for new and proposed TLVs®
- Send comments to ACGIH® (science@acgih.org)

Membership

- Need occupational physicians and epidemiologists
- Application on-line with resume/CV
- Commitment to attend 3 meetings/year, prepare at least 2 *Documentations*/year
- Must be ACGIH® member

Identification of Appropriate Toxic End-Points and Setting TLVs® for Hydrocarbon Mixtures

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