NIOSH Occupational Exposure Banding

Thomas J. Lentz, Ph.D., MPH

SCHC Fall Meeting, 2020

Intellectual Property Statement

The material contained in this presentation is the work of expert(s) selected by the Program Committee of SCHC and is intended solely for the purpose of professional development and continuing education. Material in an SCHC-sponsored presentation does not constitute a recommendation or endorsement of any kind. This material is believed to accurately represent current regulatory requirements and industry standards for hazard communication. However, SCHC cannot guarantee the accuracy or completeness of this information. Users are responsible for determining the suitability and appropriateness of these materials for any particular application.

NIOSH OCCUPATIONAL EXPOSURE BANDING: EVALUATING CHEMICAL HAZARDS

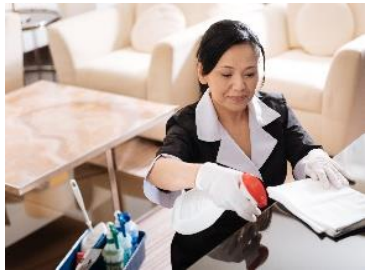
THOMAS J. LENTZ, PH.D., MPH

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

CENTERS FOR DISEASE CONTROL AND PREVENTION

CHALLENGE



- Workers are exposed to potentially harmful chemicals in their workplace.
- Occupational exposure limits (OELs) guide risk management decisions.
- Most chemicals in use and commerce lack guidance on safe levels of exposure.
- This leaves workers at risk of exposure to chemicals that may be harmful.
- CDC Strategic Priority: Prevent illness, injury, disability, and premature death.

CHEMICALS IN COMMERCE

OCCUPATIONAL EXPOSURE LIMITS

- Approximately 85,000 chemicals in commerce

- Approximately 1,000 chemicals with authoritative OELs

OBJECTIVE

To create a consistent and documented process to characterize chemical hazards so timely and well-informed risk management decisions can be made for chemicals lacking OELs.

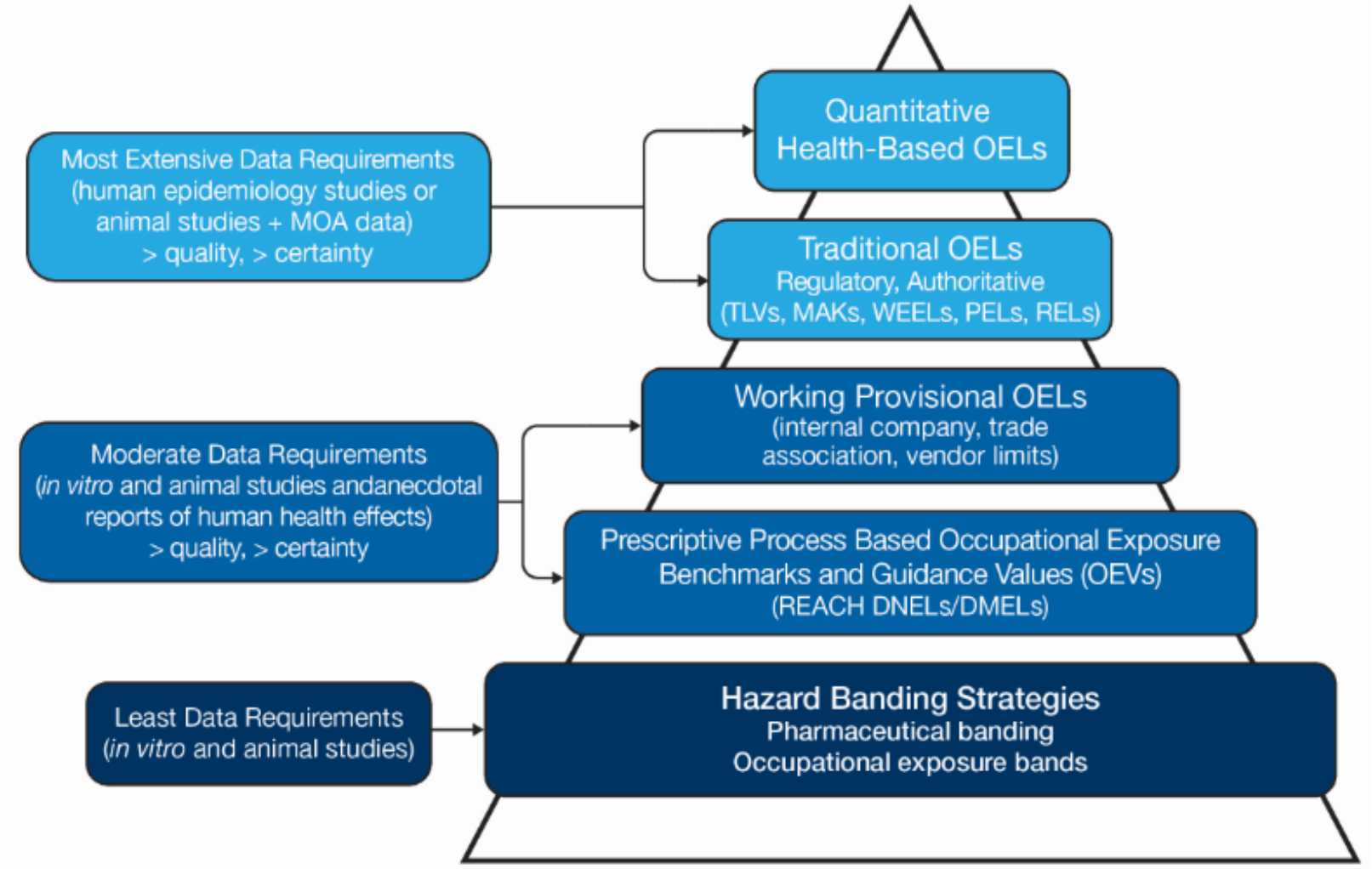
IMPORTANT POINT

An OEB is not meant to replace an OEL, rather it serves as a starting point to inform risk management decisions.

HISTORY

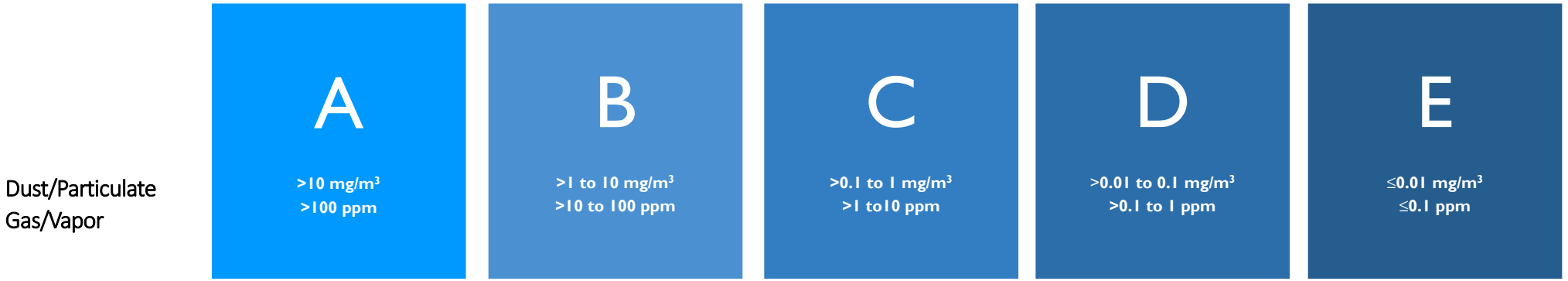
- One of the best ways to prevent and control occupational injuries, illnesses, and fatalities is to "design out" or minimize hazards and risks.
- NIOSH leads a national initiative called Prevention through Design (PtD).
- PtD encompasses all of the efforts to anticipate and design out hazards to workers in facilities, work methods and operations, processes, equipment, tools, products, new technologies, and the organization of work.
- The Occupational Exposure Banding Initiative emerged from this fundamental philosophy.

HIERARCHY OF OELS

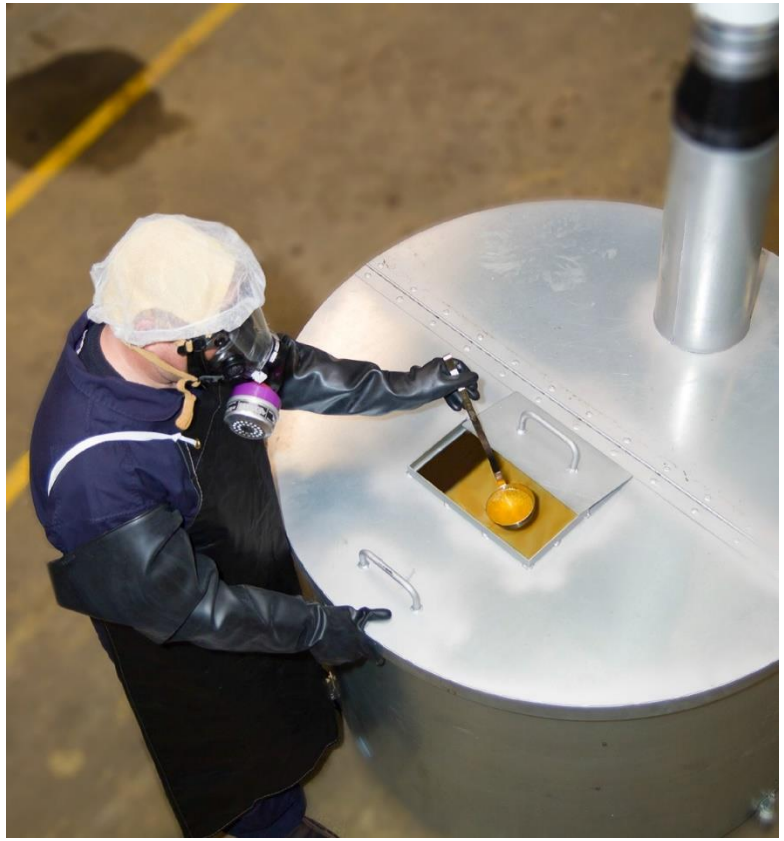


WHAT IS OCCUPATIONAL EXPOSURE BANDING?

A mechanism to quickly and accurately assign chemicals into "categories" or "bands" based on their health outcomes and potency considerations



WHY DO WE NEED OEBs?



PROPOSED NIOSH OCCUPATIONAL EXPOSURE BANDS

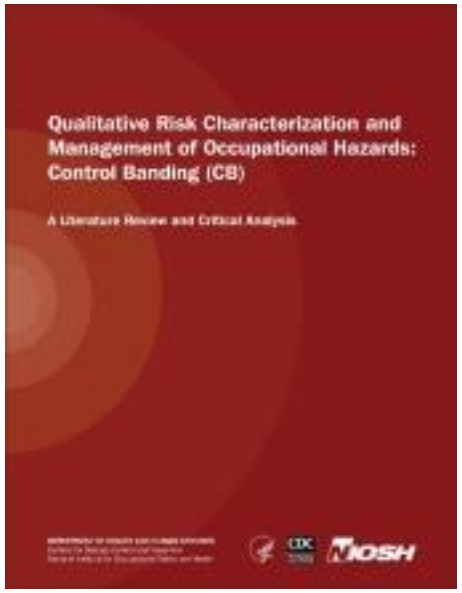
Occupational Exposure Band	Airborne Target Range for Particulate Concentration (mg/m^3)	Airborne Target Range for Gas or Vapor Concentration (ppm)
A	>10mg/m^3	>100 ppm
B	>1 to 10 mg/m^3	>10 to 100 ppm
C	>0.1 to 1 mg/m^3	>1 to10 ppm
D	>0.01 to 0.1 mg/m^3	>0.1 to 1 ppm
E	≤0.01 mg/m^3	≤0.1 ppm

THE PROMISE OF OCCUPATIONAL EXPOSURE BANDING

- Facilitates more rapid evaluation of health risk
- Provides guidance for materials without OELs
- Highlights areas where data are missing
- Provides a screening tool for the development of RELs
- Identifies hazards to be evaluated for elimination or substitution
- Aligned with GHS for hazard communication
- Facilitates the application of Prevention through Design principles

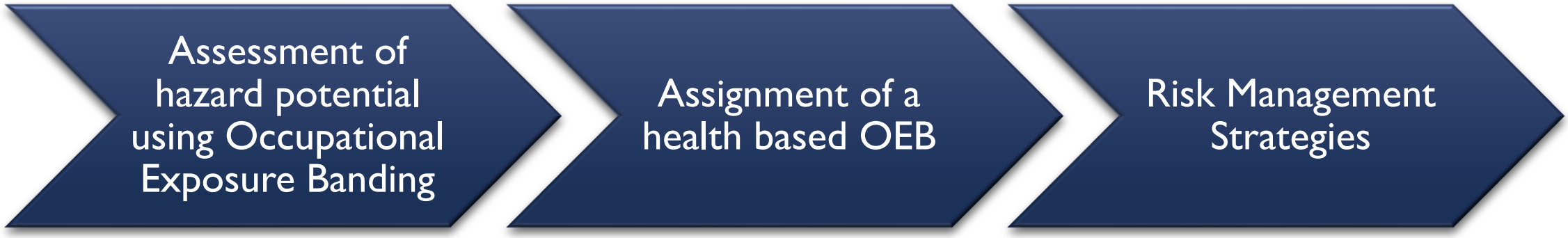
IS THIS THE SAME AS CONTROL BANDING? NO.

- ***COSHH Essentials*** is a control banding tool that helps small and medium-sized enterprises to do risk assessments for chemicals and mixtures of chemicals
  - identifies the control band (control approach),
  - produces advice on controlling risk from the chemical used in the specified task, and
  - provides written guidance and documentation as a result of the assessment
- NIOSH has reviewed control banding strategies previously



OCCUPATIONAL EXPOSURE BANDING IS DIFFERENT!

- OEBs derived from ***toxicology*** and ***potency***
- OEBs can be used to identify one of many control strategies



TOOLS FOR THE OCCUPATIONAL HYGIENIST

GHS classifications

Hazard Communication

Exposure Monitoring

Medical Surveillance

Engineering Controls

PPE

Occupational Exposure Bands

OELS

Quantitative Risk Assessments

HOW IS THE PROCESS ORGANIZED?

Bands are assigned based on the findings for nine standard toxicological endpoints:

1. Carcinogenicity
2. Reproductive toxicity
3. Specific target organ toxicity resulting from repeated exposure
4. Acute toxicity
5. Genotoxicity
6. Skin corrosion and irritation
7. Respiratory sensitization
8. Skin sensitization
9. Serious eye damage and irritation

Tier 1 —GHS Hazard Codes

User: Health and safety generalist

A Tier 1 evaluation utilizes GHS Hazard Statements and Categories to identify chemicals that have the potential to cause irreversible health effects.

Tier 2— Secondary Data Sources

User: Properly trained occupational hygienist

A Tier 2 evaluation produces a more refined OEB, based on point of departure data from reliable sources. Data availability and quality are considered.

Tier 3—Expert Judgement

User: Toxicologist or experienced occupational hygienist

Tier 3 involves the integration of all available data and determining the degree of conviction of the outcome.

TIER 1 OVERVIEW

THE FINDINGS AND CONCLUSIONS IN THIS PRESENTATION HAVE NOT BEEN FORMALLY DISSEMINATED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH AND SHOULD NOT BE CONSTRUED TO REPRESENT ANY AGENCY DETERMINATION OR POLICY.

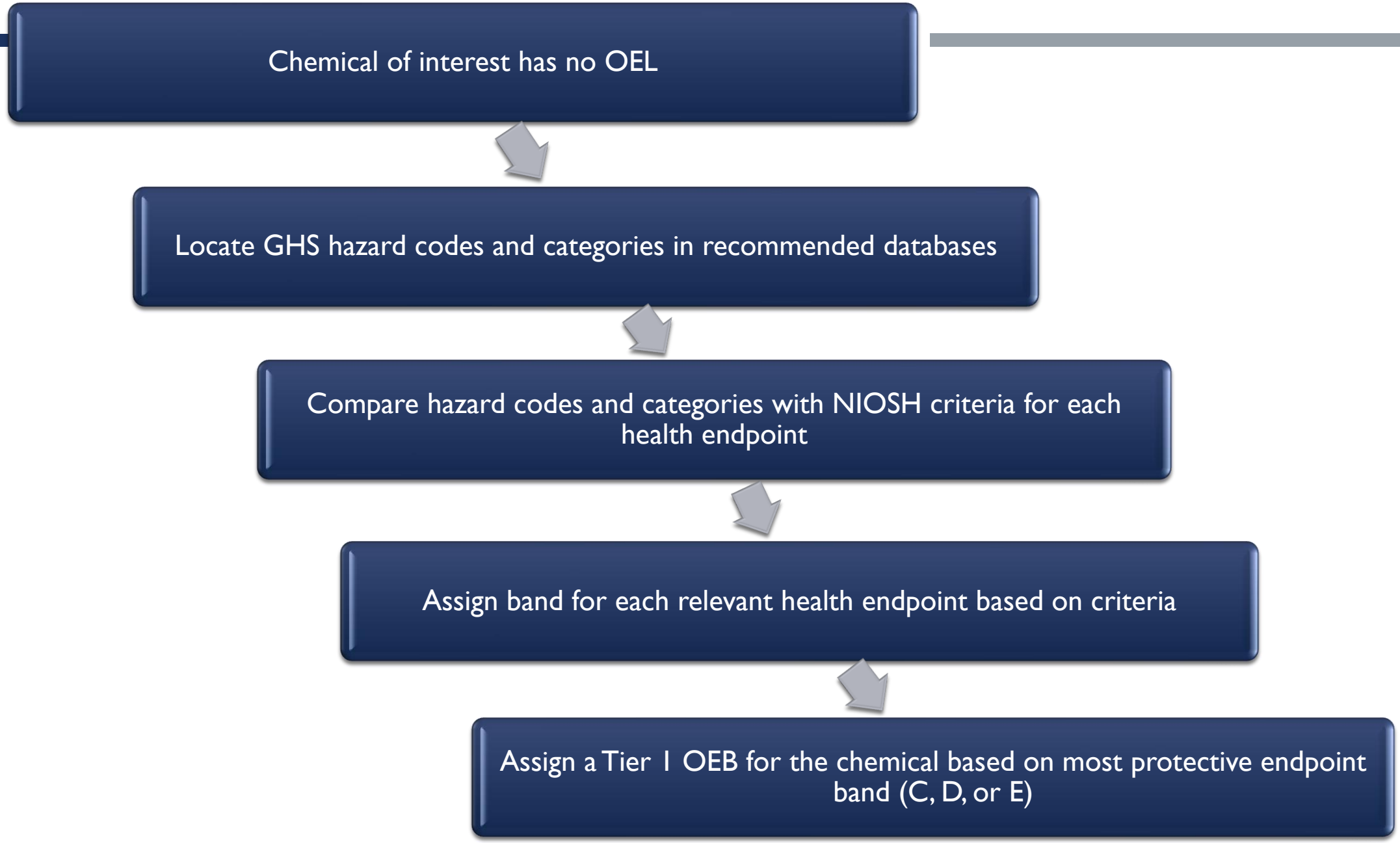
TIER 1

- GHS hazard codes and categories provide the basis for Tier 1 criteria
- Relatively low data requirements
- Chemicals can be banded in bands C, D, and E
- Chemicals are assigned Tier 1 OEBs based on severity and reversibility of effects
- Tier 1 is useful as a screening tool, but Tier 2 is recommended if data and expertise are available

GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELING OF CHEMICALS

- GHS is a hazard classification system developed by the United Nations to standardize chemical regulations in different countries
  - Within GHS, each physical or health hazard is a **hazard class** (e.g., Carcinogenicity is a hazard class)
  - A hazard class may be sub-divided into several **hazard categories** based on the severity of the hazard
  - GHS uses alphanumeric **hazard codes** to represent these hazards

TIER I Process



TIER 1 Criteria		C	D	E
OEL Ranges	Particle	> 0.1 to ≤ 1 milligrams per cubic meter of air (mg/m^3)	> 0.01 to ≤ 0.1 mg/m^3	≤ 0.01 mg/m^3
	Vapor	> 1 to ≤ 10 parts per million (ppm)	> 0.1 to ≤ 1 ppm	≤ 0.1 ppm
Acute Toxicity		H301 Category 3	H300 Category 2	H300 Category 1
		H302 Category 4		
		H331 Category 3	H330 Category 2	H330 Category 1
		H332 Category 4		
		H311 Category 3	H310 Category 2	H310 Category 1
		H312 Category 4		
Skin Corrosion/ Irritation		H315 Category 2		H314 Category 1, 1A, 1B, or 1C
Serious Eye Damage/ Eye irritation		H319 Category 2, 2A or 2B		H318 Category 1
Respiratory and Skin Sensitization		H317 Category 1B	H317 Category 1 or 1A	
			H334 Category 1B	H334 Category 1 or 1A
Genotoxicity			H341 Category 2	H340 Category 1, 1A or 1B
Carcinogenicity				H350 Category 1, 1A, or 1B
				H351 Category 2
Toxic to Reproduction		H361 (including H361f, H361d, and H361fd) Category 2	H360 (including H360f, H360d, and H360fd) Category 1B	H360 (including H360f, H360d, and H360fd) Category 1 or 1A
Specific Target Organ Toxicity		H371 Category 2		H370 Category 1
		H373 Category 2		H372 Category 1

TIER 1 Criteria		C	D	E
OEL Ranges	Particle	> 0.1 to ≤ 1 milligrams per cubic meter of air (mg/m^3)	> 0.01 to ≤ 0.1 mg/m^3	≤ 0.01 mg/m^3
	Vapor	> 1 to ≤ 10 parts per million (ppm)	> 0.1 to ≤ 1 ppm	≤ 0.1 ppm
Acute Toxicity		H301 Category 3	H300 Category 2	H300 Category 1
		H302 Category 4		
		H331 Category 3	H330 Category 2	H330 Category 1
		H332 Category 4		
		H311 Category 3	H310 Category 2	H310 Category 1
		H312 Category 4		
Skin Corrosion/ Irritation		H315 Category 2		H314 Category 1, 1A, 1B, or 1C
Serious Eye Damage/ Eye irritation		H319 Category 2, 2A or 2B		H318 Category 1
Respiratory and Skin Sensitization		H317 Category 1B	H317 Category 1 or 1A	
			H334 Category 1B	H334 Category 1 or 1A
Genotoxicity			H341 Category 2	H340 Category 1, 1A or 1B
Carcinogenicity				H350 Category 1, 1A, or 1B
				H351 Category 2
Toxic to Reproduction		H361 (including H361f, H361d, and H361fd) Category 2	H360 (including H360f, H360d, and H360fd) Category 1B	H360 (including H360f, H360d, and H360fd) Category 1 or 1A
Specific Target Organ Toxicity		H371 Category 2		H370 Category 1
		H373 Category 2		H372 Category 1

TIER I Criteria		C	D	E
OEL Ranges	Particle	> 0.1 to ≤ 1 milligrams per cubic meter of air (mg/m^3)	> 0.01 to ≤ 0.1 mg/m^3	≤ 0.01 mg/m^3
	Vapor	> 1 to ≤ 10 parts per million (ppm)	> 0.1 to ≤ 1 ppm	≤ 0.1 ppm
Acute Toxicity		H301 Category 3	H300 Category 2	H300 Category 1
		H302 Category 4		
		H331 Category 3	H330 Category 2	H330 Category 1
		H332 Category 4		
		H311 Category 3	H310 Category 2	H310 Category 1
		H312 Category 4		
Skin Corrosion/ Irritation		H315 Category 2		H314 Category 1, 1A, 1B, or 1C
Serious Eye Damage/ Eye irritation		H319 Category 2, 2A or 2B		H318 Category 1
Respiratory and Skin Sensitization		H317 Category 1B	H317 Category 1 or 1A	
			H334 Category 1B	H334 Category 1 or 1A
Genotoxicity			H341 Category 2	H340 Category 1, 1A or 1B
Carcinogenicity				H350 Category 1, 1A, or 1B
				H351 Category 2
Toxic to Reproduction		H361 (including H361f, H361d, and H361fd) Category 2	H360 (including H360f, H360d, and H360fd) Category 1B	H360 (including H360f, H360d, and H360fd) Category 1 or 1A
Specific Target Organ Toxicity		H371 Category 2		H370 Category 1
		H373 Category 2		H372 Category 1

TIER 2 OVERVIEW

THE FINDINGS AND CONCLUSIONS IN THIS PRESENTATION HAVE NOT BEEN FORMALLY DISSEMINATED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH AND SHOULD NOT BE CONSTRUED TO REPRESENT ANY AGENCY DETERMINATION OR POLICY.

TIER 2

Tier 2 is always recommended, but especially useful when:

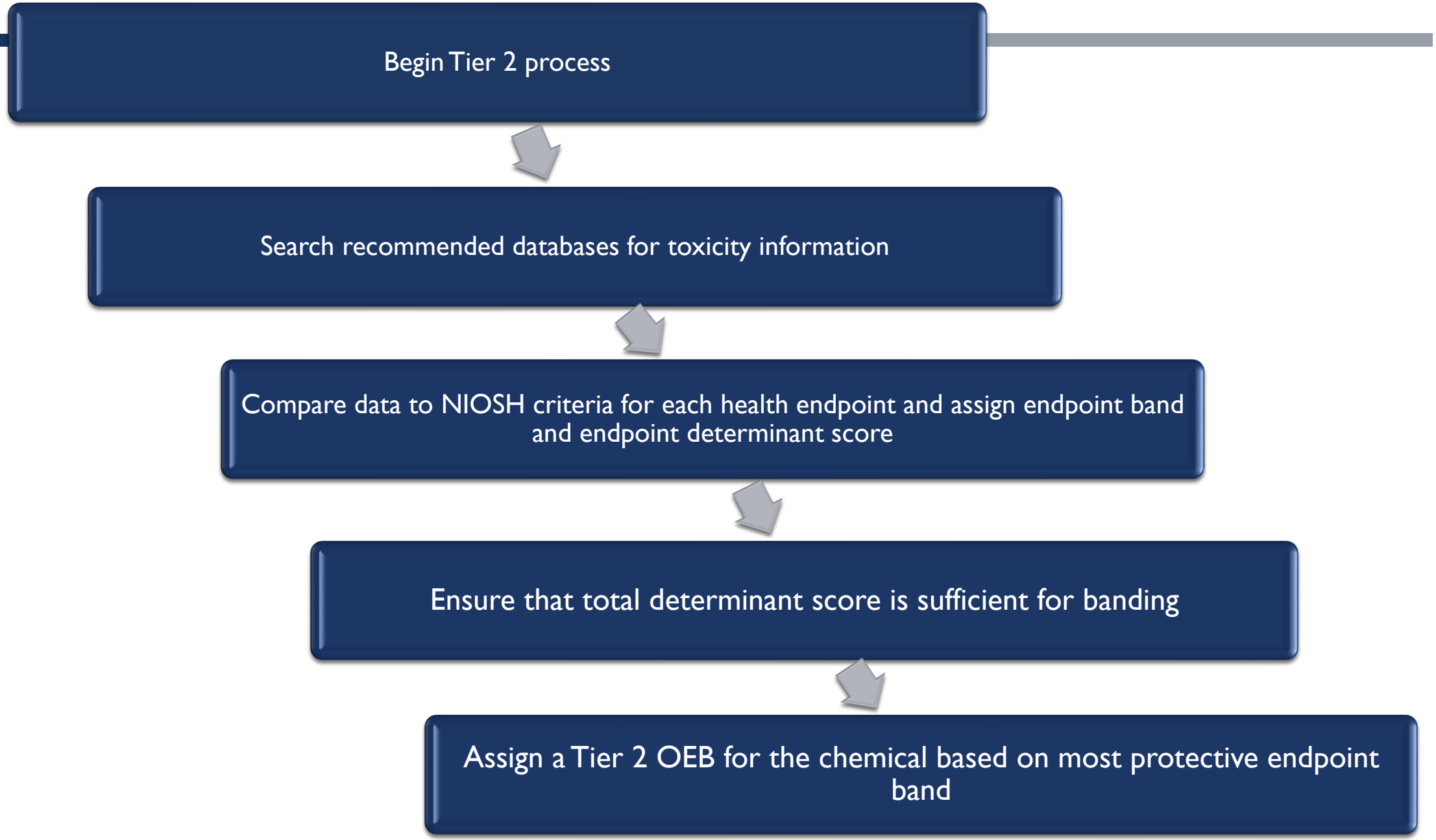
- there are no GHS H codes
- the outcome of the Tier 1 analysis is incomplete, or an insufficient reflection of the health potency of the chemical

TIER 2

Tier 2 — Both Qualitative and Quantitative

- Some training in toxicology
- Based on readily available secondary data from authoritative sources (government, professional health agencies, authoritative toxicological benchmarks)
- Needs sufficient data to generate reliable OEB
- Prescriptive analytical strategy to ensure consistency
- Potential for chemicals to be moved from the Tier 1 OEB to a more or less protective OEB

TIER 2 Process



TIER 2 BANDING PROCESS

- ***Search authoritative databases for summary toxicity information:***

  For 9 specified health endpoints, search authoritative databases for summary toxicity information

- ***Combine information through a weighted score:***

  Find the weighted score (Total Determinant Score) and calculate the Occupational Exposure Band (this is done automatically in the e-Tool)

TOTAL DETERMINANT SCORE

- **Endpoint determinant score (EDS) =** weighted score indicating the presence/absence of data for a specific health endpoint.
- **Total determinant score (TDS) =** sum of weighted scores for each health endpoint. Overall score gives an indication of sufficiency of data for banding.
  TDS ≥ 30: sufficient data for banding in Tier 2

Example: a cancer inhalation unit risk value tells us a lot about the hazardous nature of a chemical, so the presence of that information corresponds to a EDS of 30. However, an LD50 value for the acute toxicity endpoint is only weighted as a EDS of 5.

TOTAL DETERMINANT SCORE

Health Endpoint	Endpoint Determinant Score (EDS)
Skin Irritation/Corrosion	5
Eye Irritation/Corrosion	5
Skin Sensitization	5
Acute Toxicity/Lethality (LD_{50} or LC_{50})	5
Genotoxicity	5
Respiratory Sensitization	10
Systemic Target Organ Toxicity (STOT-RE)	30
Reproductive and Developmental Toxicity	30
Cancer Weight of Evidence Descriptor	20 or 30
Cancer Quantitative Measures	30
Data Sufficiency/Total Determinant Score (TDS)	30/125

TIER 3 Process

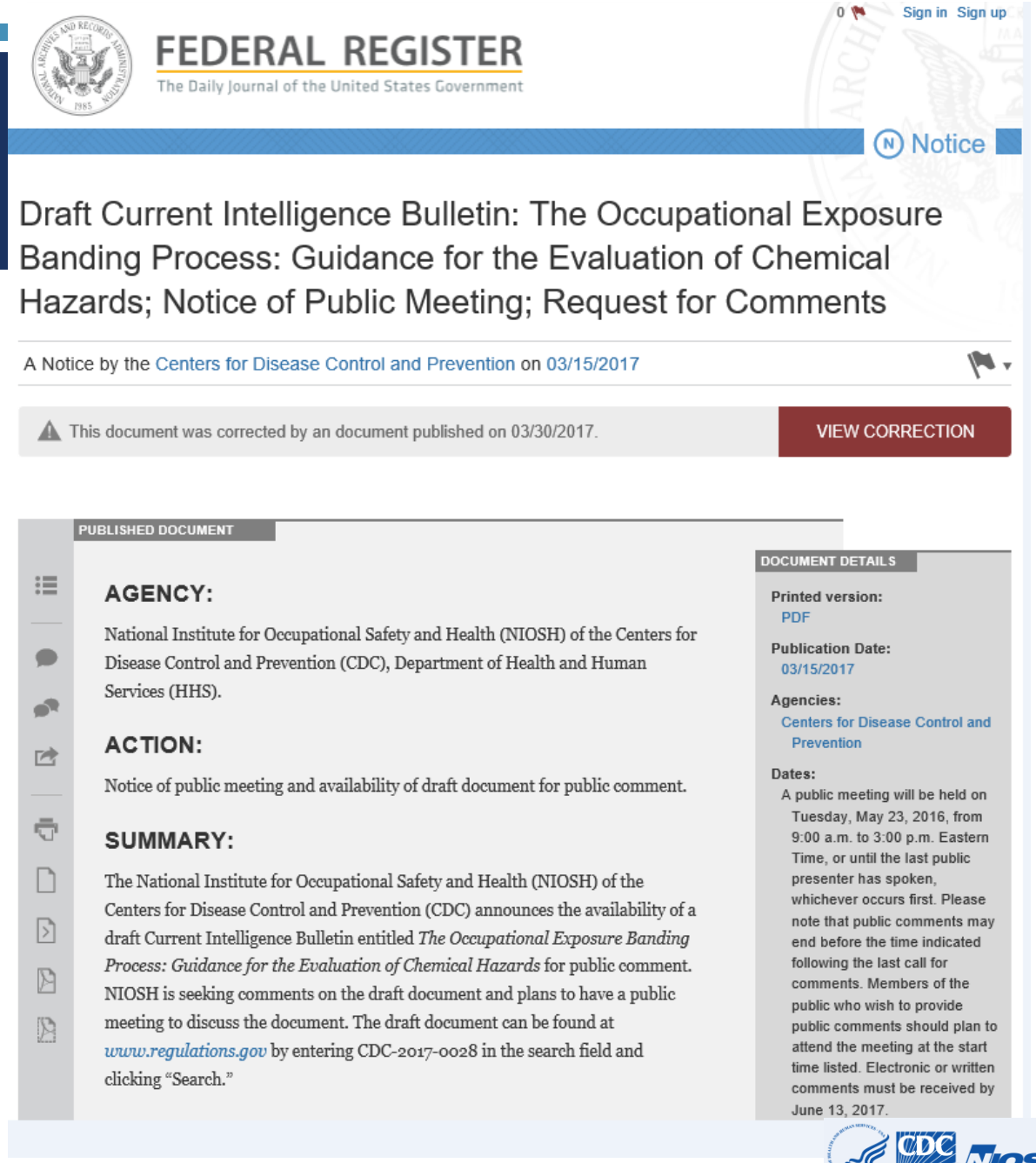
- Requires expertise in toxicology
- Requires intensive review and evaluation of primary data
- Is required when insufficient data for Tier 2 banding
- Completed when no detailed guidance is available

MORE THAN A BAND

- Identify potential health effects and target organs
- Identify health risks to improve health communication
- Inform implementation of control interventions
- Inform medical surveillance decisions
- Provide critical information in a timely fashion

MORE THAN A BAND (CONT'D)

- Innovative approach to provide guidance prescriptive enough to be used by small- and medium-sized establishments
- Occupational Exposure Banding process to provide guidance for chemicals without OELs
- Accompanying electronic tool (e-Tool) also created



FEDERAL REGISTER
The Daily Journal of the United States Government

0 Sign in Sign up

Notice

Draft Current Intelligence Bulletin: The Occupational Exposure Banding Process: Guidance for the Evaluation of Chemical Hazards; Notice of Public Meeting; Request for Comments

A Notice by the Centers for Disease Control and Prevention on 03/15/2017

This document was corrected by an document published on 03/30/2017.

VIEW CORRECTION

PUBLISHED DOCUMENT

AGENCY:

National Institute for Occupational Safety and Health (NIOSH) of the Centers for Disease Control and Prevention (CDC), Department of Health and Human Services (HHS).

ACTION:

Notice of public meeting and availability of draft document for public comment.

SUMMARY:

The National Institute for Occupational Safety and Health (NIOSH) of the Centers for Disease Control and Prevention (CDC) announces the availability of a draft Current Intelligence Bulletin entitled *The Occupational Exposure Banding Process: Guidance for the Evaluation of Chemical Hazards* for public comment. NIOSH is seeking comments on the draft document and plans to have a public meeting to discuss the document. The draft document can be found at *www.regulations.gov* by entering CDC-2017-0028 in the search field and clicking "Search."

DOCUMENT DETAILS

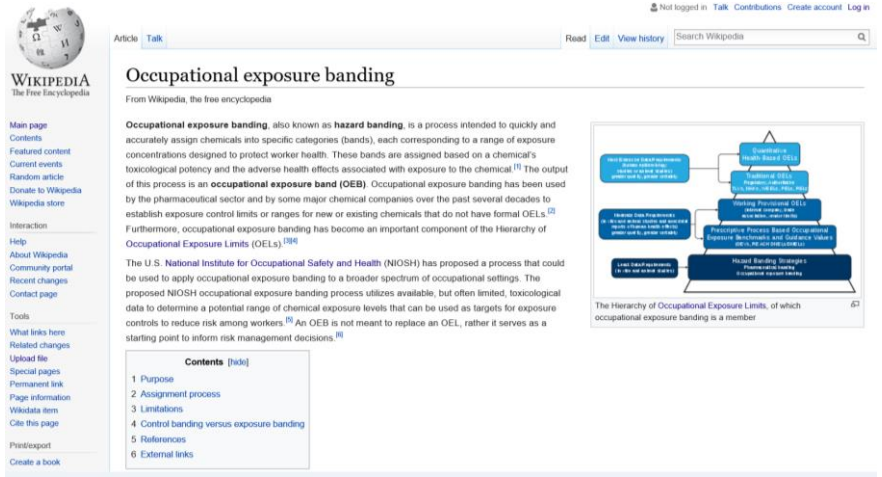
Printed version:
PDF

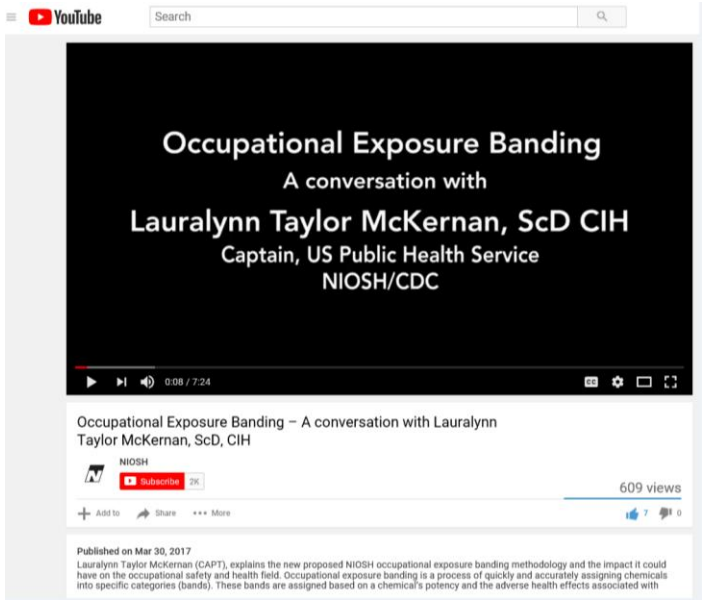
Publication Date:
03/15/2017

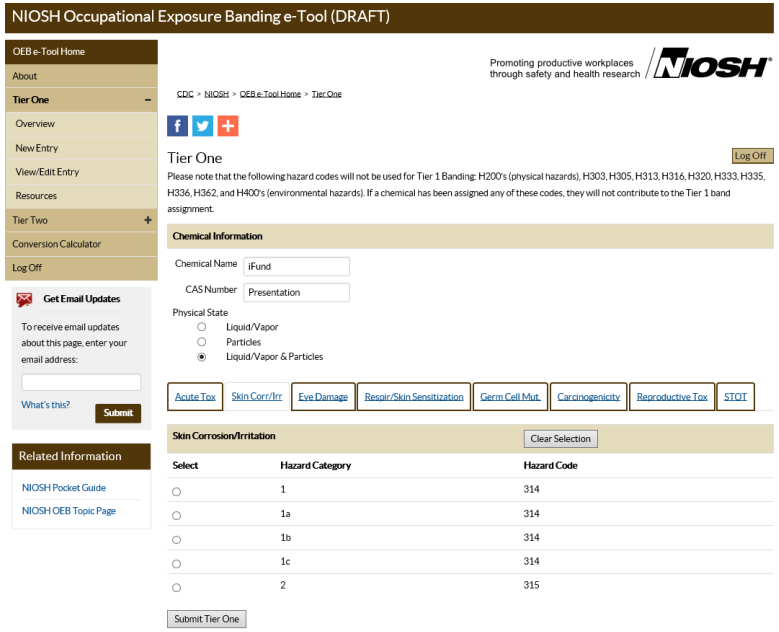
Agencies:
Centers for Disease Control and Prevention

Dates:
A public meeting will be held on Tuesday, May 23, 2016, from 9:00 a.m. to 3:00 p.m. Eastern Time, or until the last public presenter has spoken, whichever occurs first. Please note that public comments may end before the time indicated following the last call for comments. Members of the public who wish to provide public comments should plan to attend the meeting at the start time listed. Electronic or written comments must be received by June 13, 2017.

ADDITIONAL GUIDANCE



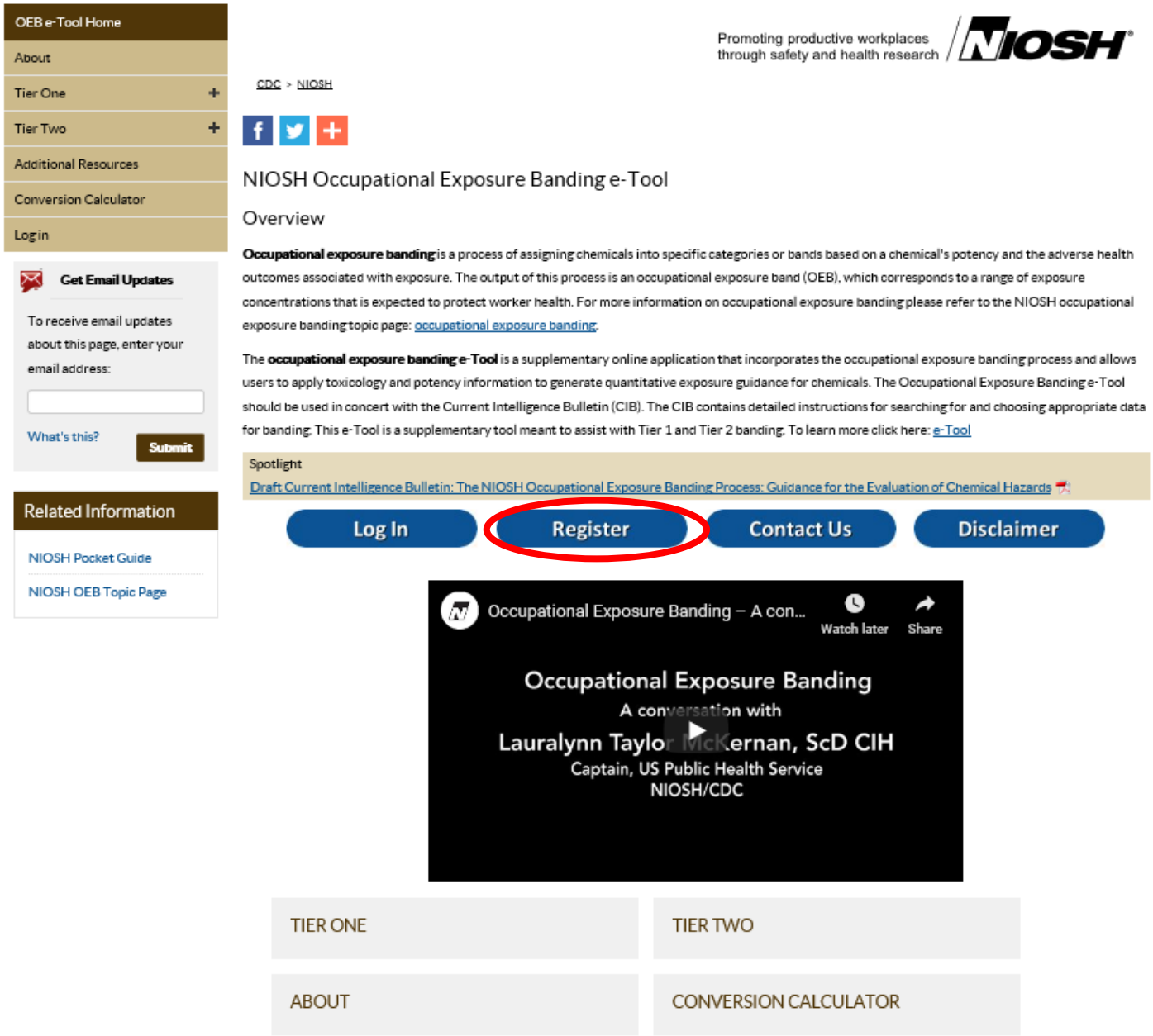




OCCUPATIONAL EXPOSURE BANDING E-TOOL

THE FINDINGS AND CONCLUSIONS IN THIS PRESENTATION HAVE NOT BEEN FORMALLY DISSEMINATED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH AND SHOULD NOT BE CONSTRUED TO REPRESENT ANY AGENCY DETERMINATION OR POLICY.

NIOSH Occupational Exposure Banding e-Tool (version 1.0)



Version 1.00 build 1

NIOSH Occupational Exposure Banding e-Tool (version 1.0)

- OEB e-Tool Home
- About
- Tier One +
- Tier Two +
- Additional Resources
- Conversion Calculator
- Log in

Promoting productive workplaces through safety and health research

NIOSH

CDC > NIOSH

Register

Create a new account.

Email (Please use a business email)

Password

Confirm password

- Must be 6 or more characters.
- Must contain one uppercase character (A through Z)
- Must contain one lowercase character (a through z)
- Must contain one number (0 through 9)
- Must contain one symbol (such as $, !, #, %)

☐ By checking this box, you have read the Disclaimer.

Register

Get Email Updates

To receive email updates about this page, enter your email address:

What's this? Submit

Related Information

- NIOSH Pocket Guide
- NIOSH OEB Topic Page

NIOSH Occupational Exposure Banding e-Tool (version 1.0)

Promoting productive workplaces through safety and health research

About

The rate at which new chemicals are being introduced into commerce significantly outpaces occupational exposure limit (OEL) development, creating a need for risk guidance on thousands of chemicals that lack evidence-based exposure limits. Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that is expected to protect worker health (Figure 1). Not to be confused with control banding (which gives guidance on control measures), the proposed NIOSH occupational exposure banding process uses available, but often limited, toxicological data to determine a potential range of exposure levels to chemicals to guide risk management decisions. For more information on occupational exposure banding please refer to the NIOSH occupational exposure banding topic page: Occupational Exposure Banding.

Figure 1: Occupational Exposure Bands (OEBs) define the range of exposures expected to be protective of worker health. The bands range from band A to band E. Band E represents the lowest range of exposure concentrations, while band A represents the highest range [McKernan et al. 2016].

To assist users of the occupational exposure banding process, an e-Tool has been developed. The NIOSH Occupational Exposure Banding e-Tool will allow users to apply toxicology and potency information to generate quantitative exposure guidance for chemicals. Users of the e-Tool are provided a series of screens which allow them to input toxicological information on nine different health endpoints related to exposure to the chemical that they are evaluating. The e-Tool provides links to publicly available databases and resources to aid the user in search of data. Once entered, the e-Tool compares the data to predefined NIOSH criteria and supplies an OEB that corresponds to a range of exposure concentrations. Ultimately, the e-Tool facilitates the use of the draft occupational exposure banding process and eliminates the need to go through the process manually.

Spotlight

Draft Current Intelligence Bulletin: The NIOSH Occupational Exposure Banding Process: Guidance for the Evaluation of Chemical Hazards

Related Information

NIOSH Pocket Guide

NIOSH OEB Topic Page

NIOSH Occupational Exposure Banding e-Tool (version 1.0)

Promoting productive workplaces through safety and health research

Overview

Tier 1 produces a qualitative occupational exposure band (OEB) assignment based on Globally Harmonized System of Classification and Labeling of Chemicals (GHS). Tier 1 involves assigning the OEB based on criteria aligned with specific GHS hazard codes and categories. Chemicals with potential to cause serious or irreversible health effects at relatively low doses warrant assigning band D or band E. Chemicals that are likely to cause reversible health effects at higher concentrations are categorized in band C. Bands A and B are not assigned in Tier 1. Tier 1 is intended to be used by individuals with basic toxicology knowledge.

Please note that the following hazard codes will not be used for Tier 1 Banding: H200's (physical hazards), H303, H305, H313, H316, H320, H333, H335, H336, H362, and H400's (environmental hazards). If a chemical has been assigned any of these codes, they will not contribute to the Tier 1 band assignment.

Tier 1 Criteria | Tier 1 Examples | Tier 1 Resources

Basic instructions to use the Occupational Exposure Banding e-Tool for Tier 1.

Step 1: Enter chemical name and/or CAS number.
If the chemicial has an OEL listed in the NIOSH Pocket Guide, you will be redirected to the Pocket Guide entry.

Step 2: Select the physical state of the chemical.
This allows the tool to display the appropriate units for the expsoure range that corresponds to the OEB.

Step 3: Choose to auto fill data from GESTIS Substance Database or enter your own data.
The e-Tool has been linked to the GESTIS Substance Database and the data can be auto-filled for chemicals found in the GESTIS database. Users can also use Annex VI or safey data sheets (SDS) to find and enter H-codes and categories manually. Links are provided in the resources tab on the left navigation pane.

Step 4: If data is auto-filled move to Step 5. Otherwise enter GHS information into the e-Tool.
If the data was not auto-filled use Annex VI or SDS to enter data by clicking through the health endpoint tabs across the page to select the appropriate hazard code/category combination for each endpoint.

Step 5: Click "Submit Tier One."
A recommendation page will display the information that was submitted, the Tier 1 OEB, and the coresponding exposure range.

Step 6: Review results and edit entry if necessary.
If everything is correct, the OEB can be applied. If not, select "Edit This Entry" in the yellow highlighted section on the bottom of the screen.

Related Information

- NIOSH Pocket Guide
- NIOSH OEB Topic Page

NIOSH Occupational Exposure Banding e-Tool (version 1.0)

- OEB e-Tool Home
- About
- **Tier One** −
  - Overview
  - New Entry
  - View/Edit Entry
  - Recommended Sources
- Tier Two +
- Additional Resources
- Conversion Calculator
- Log Off

Get Email Updates

To receive email updates about this page, enter your email address:

What's this? **Submit**

Related Information

- NIOSH Pocket Guide
- NIOSH OEB Topic Page

Promoting productive workplaces through safety and health research NIOSH

CDC > NIOSH > OEB e-Tool Home > Tier One

Chemical Information

Log Off

Please note that the following hazard codes will not be used for Tier 1 Banding: H200's (physical hazards), H303, H305, H313, H316, H320, H333, H335, H336, H362, and H400's (environmental hazards). If a chemical has been assigned any of these codes, they will not contribute to the Tier 1 band assignment.

Chemical Information

Chemical Name

CAS Number

Physical State

- ○ Vapor
- ○ Particles
- ◉ Vapor & Particles

Auto Fill Gestis Data?

- ◉ Yes
- ○ No

Submit Chemical

NIOSH Occupational Exposure Banding e-Tool (version 1.0)

- OEB e-Tool Home
- About
- **Tier One** −
  - Overview
  - New Entry
  - View/Edit Entry
  - Recommended Sources
- Tier Two +
- Additional Resources
- Conversion Calculator
- Log Off

Get Email Updates

To receive email updates about this page, enter your email address:

What's this? **Submit**

Related Information

- NIOSH Pocket Guide
- NIOSH OEB Topic Page

Promoting productive workplaces through safety and health research NIOSH

CDC > NIOSH > OEB e-Tool Home > Tier One

Chemical Information

Log Off

Please note that the following hazard codes will not be used for Tier 1 Banding: H200's (physical hazards), H303, H305, H313, H316, H320, H333, H335, H336, H362, and H400's (environmental hazards). If a chemical has been assigned any of these codes, they will not contribute to the Tier 1 band assignment.

Chemical Information

Chemical Name: forma ×

CAS Number

Physical State

- ○ Vapo
- ○ Part
- ◉ Vapo

Auto Fill Gestis Da

- ◉ Yes
- ○ No

Submit Chemical

- formal glycol
- formaldehyde
- formaldehyde cyanohydrin
- formaldehyde diethyl acetal
- formaldehyde di-n-butyl acetal
- formaldehyde reaction product with butylphenol
- formaldehydedimethylacetal
- formalin
- formalith
- formamide
- formamidinesulfinic acid
- formamine
- formanilide

NIOSH Occupational Exposure Banding e-Tool (version 1.0)

Promoting productive workplaces through safety and health research

Chemical Information

Log Off

Please note that the following hazard codes will not be used for Tier 1 Banding: H200's (physical hazards), H303, H305, H313, H316, H320, H333, H335, H336, H362, and H400's (environmental hazards). If a chemical has been assigned any of these codes, they will not contribute to the Tier 1 band assignment.

Chemical Information

Chemical Name: formaldehyde — NIOSH Pocket Guide lists an OEL for this chemical. Tier 1 Banding is not recommended

CAS Number: 50-00-0 — NIOSH Pocket Guide lists an OEL for this chemical. Tier 1 Banding is not recommended

Physical State
- ○ Vapor
- ○ Particles
- ◉ Vapor & Particles

Auto Fill Gestis Data?
- ◉ Yes
- ○ No

Submit Chemical

Related Information

- NIOSH Pocket Guide
- NIOSH OEB Topic Page

NIOSH Occupational Exposure Banding e-Tool (version 1.0)

Promoting productive workplaces through safety and health research

Tier One

Please note that the following hazard codes will not be used for Tier 1 Banding: H200's (physical hazards), H303, H305, H313, H316, H320, H333, H335, H336, H362, and H400's (environmental hazards). If a chemical has been assigned any of these codes, they will not contribute to the Tier 1 band assignment.

Gestis lists the information of this chemical. It has been auto-filled.

Related Information

- NIOSH Pocket Guide
- NIOSH OEB Topic Page

Chemical Information

Chemical Name	Ethylene glycol methacr
CAS Number	868-77-9
Physical State	Vapor & Particles

Carcinogenicity | Reproductive Tox | STOT | Genotoxicity | Resp/Skin Sensitization | Acute Tox | Skin Corr/Irr | Eye Damage/Irr

Carcinogenicity Clear Selection

Select	Hazard Category	Hazard Code	Hazard Statement
○	1	350	May cause cancer
○	1a	350	May cause cancer
○	1b	350	May cause cancer
○	2	351	Suspected of causing cancer

Submit Tier One

NIOSH Occupational Exposure Banding e-Tool (version 1.0)

- OEB e-Tool Home
- About
- Tier One +
- Tier Two +
- Additional Resources
- Conversion Calculator
- Log Off

Get Email Updates

To receive email updates about this page, enter your email address:

What's this? Submit

Related Information

- NIOSH Pocket Guide
- NIOSH OEB Topic Page

Promoting productive workplaces through safety and health research NIOSH

CDC > NIOSH

Tier One Recommendation

Overall Recommended Band

D

Vapor Range: > 0.1 and < 1 ppm

Particle Range: > 0.01 and < 0.1 mg/m³

Chemical Name: Ethylene glycol methacrylate
CAS#: 868-77-9

Endpoint		Hazard Code	Hazard Category	Endpoint Band
Acute Toxicity	Dermal			
	Oral			
	Inhalation			
Skin Corrosion/Irritation		315	2	C
Serious Eye Damage/ Eye Irritation		319	2	C
Respiratory and Skin Sensitization		317	1 (skin)	D
Germ Cell Mutagenicity				
Carcinogenicity				
Reproductive Toxicity				
Specific Target Organ Toxicity				
Overall Recommended Band				**D**

Please do not use the back button. Using the back button will result in multiple entries.
Click the button below to make changes to data inputs.

Edit this Entry

- Grey Box – No Data Entered

NIOSH Occupational Exposure Banding e-Tool (version 1.0)

Promoting productive workplaces through safety and health research

Tier One Edit

Log Off

List of Existing Tier One Entries Print PDF

Chemical Name	CAS Number	Vapor Range	Particles Range	Recommended Band			
test rane 11	test rane 11	<= 0.1 ppm	<= 0.01 mg/m³	**E**	Edit	Delete	Print PDF
test rane 1	test rane 1	<= 0.1 ppm		**E**	Edit	Delete	Print PDF
test rane	all hands	<= 0.1 ppm		**E**	Edit	Delete	Print PDF
test 45	test 45	<= 0.1 ppm	<= 0.01 mg/m³	**E**	Edit	Delete	Print PDF
test 24		> 1 and < 10 ppm	> 0.1 and < 1 mg/m³	**C**	Edit	Delete	Print PDF
test 111	106-94-5	> 1 and < 10 ppm	> 0.1 and < 1 mg/m³	**C**	Edit	Delete	Print PDF
test 1 rane	test 1 rane	<= 0.1 ppm		**E**	Edit	Delete	Print PDF

Get Email Updates

To receive email updates about this page, enter your email address:

OEB E-TOOL LINK

https://wwwn.cdc.gov/niosh-oeb

DISSEMINATION

- Occupational safety and health professionals who serve small- and medium-sized businesses
- Stakeholders from multiple organizations, including organized labor, industry safety and health professionals, and government agencies
  - Feedback is overwhelmingly positive
  - Confirmed need for a banding approach and tool
  - Suggestions for improvement – simplicity and training

NEXT STEPS

- Promote broad application of e-Tool and banding guidance
- Address public health challenge of protecting workers from the myriad chemicals lacking guidance
- Coordinate with partners (AIHA, ASSP, SCHC) for dissemination and continuing widespread use in the occupational safety and health community

OEB TEAM MEMBERS

- Jane Chen, M.S.
- Stephen J. Gilbert, M.S.
- Thomas J. Lentz, Ph.D.
- Andy Maier, Ph.D., CIH, DABT
- Lauralynn Taylor McKernan, Sc.D., CIH,
- Pranav Rane, M.P.H.
- Melissa Seaton, M.S.
- Christine Whittaker, Ph.D.