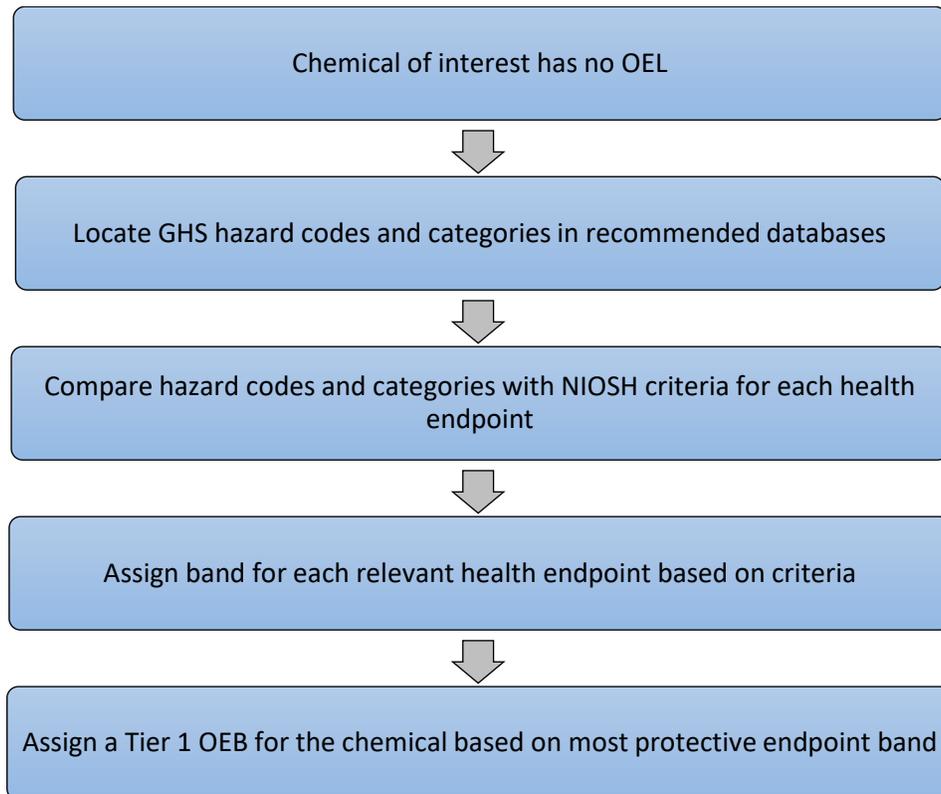


Tier 1 Resources

Tier 1 overview



Data Sources for GHS Hazard Codes and Categories

A number of resources can be used to obtain hazard statements, codes, and categories. NIOSH recommends the following as information sources:

Annex VI to the Classification, Labelling and Packaging of substances and mixtures (CLP)

Annex VI is a European database of approximately 1300 chemicals that is part of the Classification and Labeling and Packaging of chemical substances and mixtures. This database can be found on the website of the European Chemical Agency [ECHA 2013]. Information on chemicals and mixtures, including GHS hazard statements, codes, and categories can be found in Annex VI.

GESTIS Substance Database

GESTIS is a hazardous chemical database of the German Social Accident Insurance that contains approximately 8000 chemicals [GESTIS 2012]. This website can be found at: <http://gestis-en.itrust.de/>. Information in GESTIS includes toxicological data, physical and chemical properties, regulations, and hazard statements, codes, and categories.

Safety Data Sheets

Safety data sheets (SDSs) are the primary channel through which manufacturers communicate chemical safety and health information to workers and emergency response personnel who may be exposed to hazardous chemicals. The OSHA hazard communication standard is now aligned with the GHS, meaning that manufacturers must provide a harmonized hazard statement for each hazard class and category [OSHA 2012]. As of June 1, 2015, OSHA-compliant SDSs will contain GHS hazard statements, codes, and categories that can be used for Tier 1 analysis (Figure 1).

Figure 1: Required elements in Section 2 of OSHA compliant safety data sheets as defined by the hazard communication standard (29 CFR 1910.1200(g)), revised in 2012.

| Section 2: Hazard(s) Identification |
|---|
| <p>This section identifies the hazards of the chemical presented on the SDS and the appropriate warning information associated with those hazards. The required information consists of:</p> <ul style="list-style-type: none">▪ The hazard classification of the chemical (e.g., flammable liquid, category¹).▪ Signal word.▪ Hazard statement(s).▪ Pictograms (the pictograms or hazard symbols may be presented as graphical reproductions of the symbols in black and white or be a description of the name of the symbol (e.g., skull and crossbones, flame).▪ Precautionary statement(s).▪ Description of any hazards not otherwise classified.▪ For a mixture that contains an ingredient(s) with unknown toxicity, a statement describing how much (percentage) of the mixture consists of ingredient(s) with unknown acute toxicity. Please note that this is a total percentage of the mixture and not tied to the individual ingredient(s). |

Tier 1 Criteria Overview: GHS Hazard Codes and Categories for Tier 1

| Preliminary NIOSH 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 (skin) | H317 Category 1 or 1A | — |
| | | H335 Category 3 | H334 Category 1B | H334 Category 1 or 1A | |
| Germ cell mutagenicity | | — | H341 Category 2 | H340 Category 1, 1A or 1B | |
| | Carcinogenicity | — | — | H350 Category 1, 1A, or 1B | |
| Reproductive Toxicity | | 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 | | |

Note that the following hazard codes will not be used for Tier 1 Banding: H200's, H303, H304, H305, H313, H316, H320, H333, H336, H362, and H400's.

Tier 1 Worksheet

| Chemical Name: | | | | | |
|------------------------------------|------------|-------------|-----------------|---------------|---------------|
| CAS: | | | | | |
| Endpoint | | Hazard Code | Hazard Category | H-code Source | Endpoint Band |
| Acute Toxicity | Inhalation | | | | |
| | Oral | | | | |
| | Dermal | | | | |
| Skin Corrosion/Irritation | | | | | |
| Eye Damage/Eye Irritation | | | | | |
| Respiratory and Skin Sensitization | | | | | |
| Germ Cell Mutagenicity | | | | | |
| Carcinogenicity | | | | | |
| Reproductive Toxicity | | | | | |
| Specific Target Organ Toxicity | | | | | |
| Most Protective Tier 1 Band | | | | | |

Notes: