

Using the NIOSH Pocket Guide mobile app

The need for information about hazardous materials often occurs away from an internet-connected computer or printed resources. A mobile app, or simply app, is a specialized program – or application – downloaded onto mobile devices. Apps available through a smartphone or tablet can be used to get needed information on hazardous materials for decision making.

As stated by NIOSH at <https://www.cdc.gov/niosh/npg>, "The NIOSH Pocket Guide to Chemical Hazards informs workers, employers, and occupational health professionals about workplace chemicals and their hazards." The resource is also useful to anyone who wants information about chemical hazards. Training on the use of the NIOSH Pocket Guide mobile app can assist in site characterization and analysis, 29CFR1910.120(c), and personal protective equipment selection, 29CFR1910.120(g)(3).

The app can be accessed using a smartphone or tablet. There is also an online version for computer use.

Objectives

When completed, you will be better able to:

- Gather information about a chemical hazard using the NIOSH Pocket Guide mobile app
- Identify a chemical concentration that is immediately dangerous to life and health (IDLH) using the NIOSH Pocket Guide mobile app
- Select a category of respiratory protection for a chemical exposure scenario using the NIOSH Pocket Guide mobile app

Review the Resource

The National Institute for Occupational Safety and Health (NIOSH), part of the U.S. Centers for Disease Control and Prevention in the U.S. Department of Health and Human Services, is a research agency focused on the study of worker safety and health. NIOSH helps employers and workers create safe and healthy workplaces.

The NIOSH Pocket Guide (NPG) mobile app provides detailed data on a wide range of industrial chemicals. The database is searchable, with a separate page for each chemical. The data available on each page include the following, with descriptions extracted and revised from the descriptions provided by NIOSH at <https://www.cdc.gov/niosh/npg/pgintrod.html>:

- **Chemical Name**: The chemical name found in the OSHA General Industry Air Contaminants Standard (29 CFR 1910.1000) is listed at the top of the page.
- **CAS Number**: The Chemical Abstracts Service (CAS) registry number, in the format xxx-xx-x, is unique for each chemical.
- **Formula**: The chemical formula for the compound is provided.
- **Synonyms and Trade Names**: Common synonyms and trade names for each chemical are listed alphabetically.
- **DOT ID and Guide Numbers**: U.S. Department of Transportation (DOT) identification (ID) and corresponding guide numbers are provided in the format is xxxx yyy. The ID number (xxxx) indicates that the chemical is regulated by DOT. The guide number (yyy) indicates actions to be taken during an emergency situation in accordance with the DOT Emergency Response Guidebook.
- **RTECS Number**: The Registry of Toxic Effects of Chemical Substances (RTECS) number, in the format ABxxxxxxx, can be used to locate additional toxicological information on the compound.
- **IDLH**: The concentration of the compound that is immediately dangerous to life or health (IDLH) is established by NIOSH using criteria that may include acute human toxicity data, acute animal toxicity data, chronic toxicity data, analogy to a chemically-similar substance, 10% of lower explosive limit, and acute animal respiratory irritation data. The IDLH represents the airborne concentration from

which a person could escape without injury or irreversible health effects. The notation "Ca" is listed in the IDLH field if NIOSH considers the compound a potential occupational carcinogen. The notation "10%LEL" indicates that the IDLH is based on 10% LEL. The notation "N.D." indicates that an IDLH value has not been determined for the compound.

- **Conversion Factors**: This is the value for the conversion of ppm (parts of vapor or gas per million parts of contaminated air by volume) to mg/m³ (milligrams of vapor or gas per cubic meter of contaminated air) at a temperature of 25 °C and pressure of 1 atmosphere, for compounds with exposure limits expressed in ppm.
- **NIOSH REL**: Recommended exposure limits (RELs) have been established by NIOSH. A time-weighted average concentration, designated by "TWA" preceding the value, is for up to a 10-hour work day during a 40-hour work week. A short-term exposure limit (STEL), designated by "ST" preceding the value, is a 15-minute TWA exposure that should not be exceeded at any time during a workday. A ceiling REL, designated by "C" preceding the value, should not be exceeded at any time. The notation "Ca" indicates that NIOSH considers the compound a potential occupational carcinogen.
- **OSHA PEL**: Permissible exposure limits (PELs) are established by the Occupational Safety and Health Administration (OSHA). TWA concentrations for OSHA PELs must not be exceeded during any 8-hour work shift of a 40-hour workweek. A STEL is designated by "ST" preceding the value and is measured over a 15-minute period unless noted otherwise. Ceiling concentrations, designated by "C" preceding the value, must not be exceeded during any part of the workday.
- **Measurement Methods**: A source and method number are provided for methods that can be used to determine the exposure for the compound.
- **Chemical and Physical Properties**: Chemical and physical properties given for each substance include the following, with "NA" indicating that a property is not applicable and a question mark (?) indicating that it is unknown.

Molecular weight

Boiling point at 1 atmosphere, °F

Freezing point for liquids and gases, °F

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Melting point for solids, °F

Solubility in water at 68 °F, % by weight (i.e., g/100 ml)

Vapor pressure at 68 °F, mm Hg

Ionization potential, eV

Relative gas density, referenced to air = 1

Specific gravity at 68 °F, referenced to water at 39.2 °F

Flash point, closed cup, unless annotated "(oc)" for open cup, °F

Upper explosive limit in air, % by volume

Lower explosive limit in air, % by volume

Minimum explosive concentration, g/m³

Flammability class (Fl.P. = Flash point; BP = Boiling point)

Class IA flammable liquid	Fl.P. below 73 °F and BP below 100 °F.
Class IB flammable liquid	Fl.P. below 73 °F and BP at or above 100 °F.
Class IC flammable liquid	Fl.P. at or above 73 °F and below 100 °F.
Class II combustible liquid	Fl.P. at or above 100 °F and below 140 °F.
Class IIIA combustible liquid	Fl.P. at or above 140 °F and below 200 °F.
Class IIIB combustible liquid	Fl.P. at or above 200 °F.

- Physical Description: The appearance and odor of each compound are described.
- PPE Skin: Recommends the need for personal protective clothing.
- PPE Eyes: Recommends the need for eye protection.
- PPE Wash Skin: Recommends when the spilled chemical should be washed from the body, in addition to normal washing (for example, before eating).
- PPE Remove: Advises when a person should remove clothing that has accidentally become wet or significantly contaminated.
- PPE Change: Recommends whether the routine changing of clothing is needed.

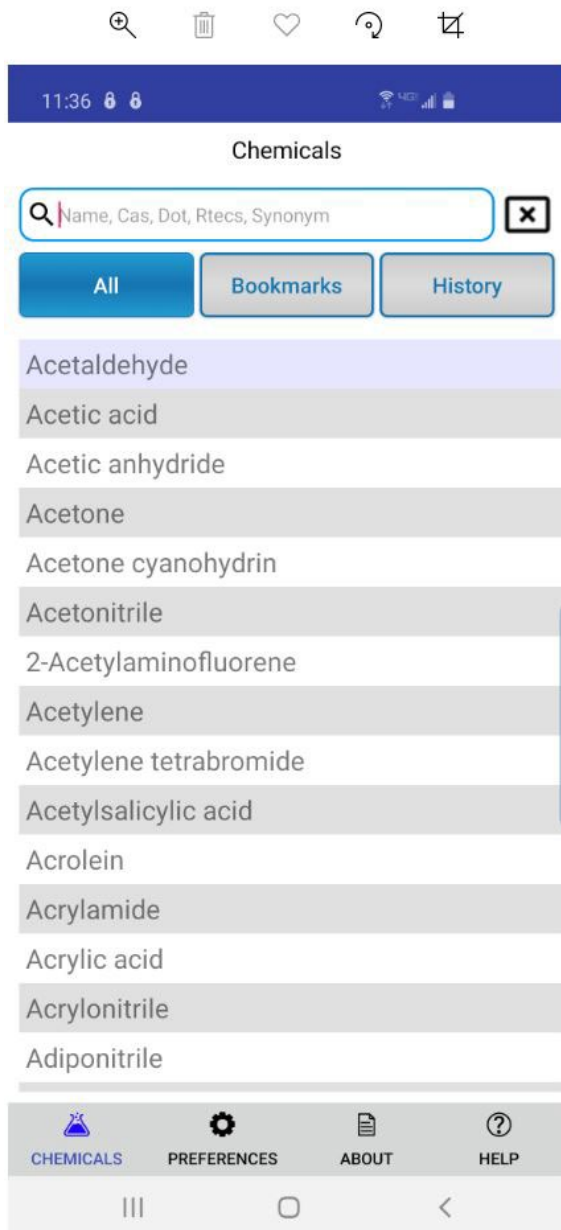
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- **PPE Provide:** Recommends the need for eyewash fountains and/or quick drench facilities.
- **Respirator Selection Recommendations:** The first line in the entry indicates whether the NIOSH or OSHA exposure limit is used for respirator recommendations. Each subsequent line lists a maximum use concentration followed by the classes of respirators, with their assigned protection factors that are acceptable for use up to the maximum use concentration. More protective respirators may be worn. "Emergency or planned entry into unknown concentrations or entry into IDLH conditions" is followed by the classes of respirators acceptable for these conditions. "Escape" indicates that the respirators are to be used only for escape purposes.
- **Incompatibilities and Reactivities:** This entry lists important hazardous incompatibilities or reactivities for each substance.
- **Exposure Route:** This section lists the toxicologically important routes of human exposure and whether contact with the skin or eyes may be hazardous.
- **Symptoms:** This entry lists the potential symptoms of exposure and whether NIOSH considers the substance a potential occupational carcinogen.
- **Target Organs:** This entry lists the organs that are affected by exposure to each substance.
- **Cancer Site:** For carcinogens, the type(s) of cancer are listed.
- **First Aid Eye:** Lists emergency procedures for eye contact with chemical.
- **First Aid Skin:** Lists emergency procedures for skin contact with chemical.
- **First Aid Inhalation:** Lists emergency procedures for inhalation of chemical.
- **First Aid Ingestion:** Lists emergency procedures for ingestion of chemical.
- **ICSC Card:** Lists the International Chemical Safety Card number.
- **Medical tests:** Provides link to additional information.

Using the app

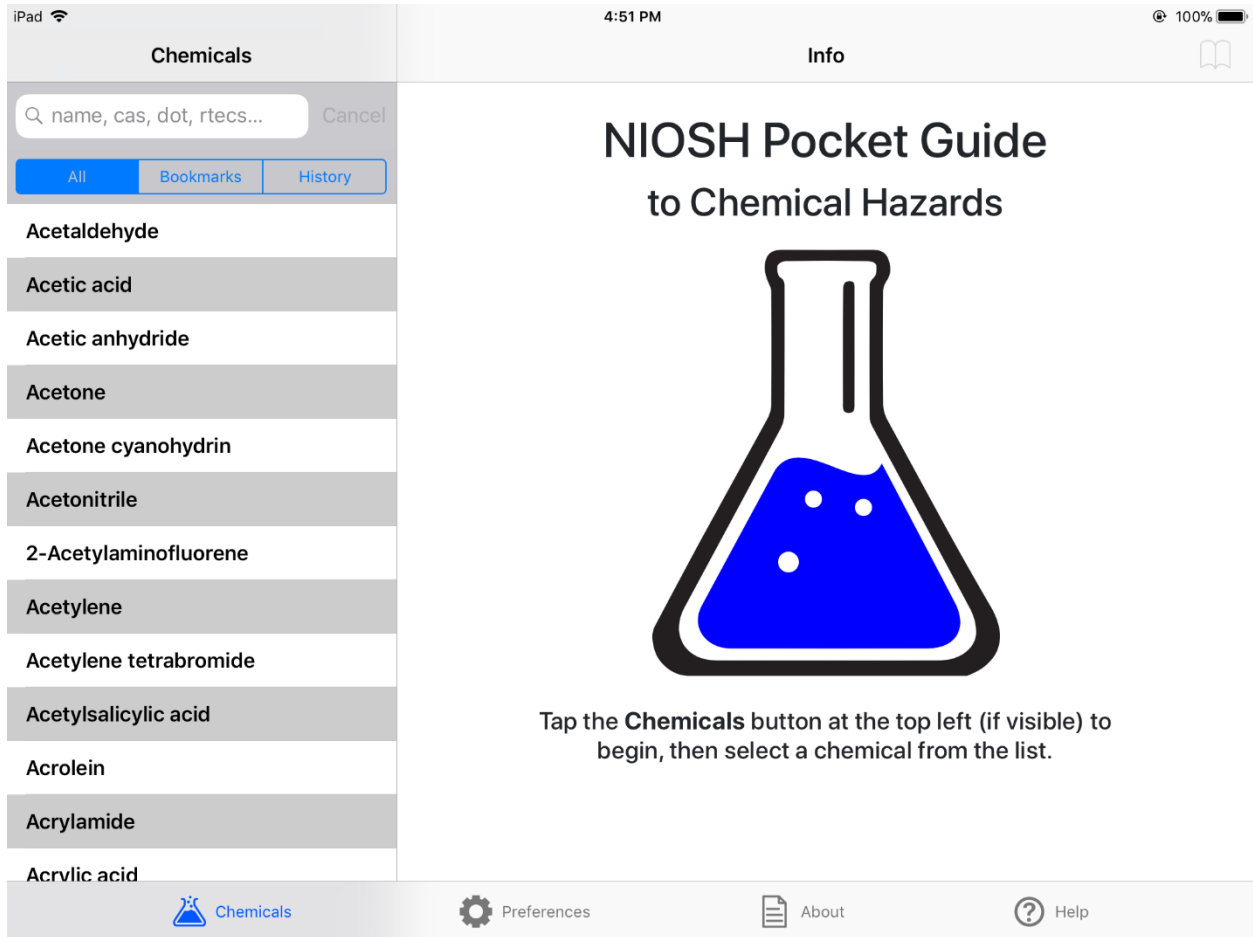
The mobile app operates similarly on a smartphone or tablet. When you open the NIOSH Pocket Guide mobile app, you will see the main search page.

The home page for a smartphone is shown below:



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The home page for a tablet is shown below:



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The resource informs the user about chemicals and their hazards. The user will typically start on the home page, which is also the search page for the app.

At the top of the home page is a field that allows you to enter a chemical name (or synonym), CAS number, DOT ID or RTECS number to search for information on a specific chemical. If multiple chemicals fit your search term, you are provided a list from which you can choose. Once you choose a specific chemical, you are taken to a page that provides the information described previously: chemical names, synonyms, trade names, CAS numbers, RTECS numbers, DOT ID and Guide numbers, chemical structure/formula, conversion factors, NIOSH RELs, OSHA PELs, NIOSH IDLH values, physical descriptions and chemical and physical properties of agents, measurement methods, personal protection and sanitation recommendations, respirator selection recommendations incompatibilities and reactivities of agents, exposure routes, symptoms of exposure, target organs, and first-aid recommendations.

The top of the home page also has a **Bookmarks** button so you can save chemicals for easy access in the future as well as a **History** button so you can review chemicals you previously searched for. Return to the search page by selecting the **All** button.

The bottom of the home page has 4 buttons – **Chemicals, Preferences, About, Help**. The **Chemicals** button takes you to the home page, from which searches can be made. The **Preference** button allows you to customize the information shared for each chemical.

The **About** button takes the user to the appendices. The appendices provide additional information as necessary including NIOSH policies on designating potential occupational carcinogens (Appendix A), OSHA-regulated carcinogens (Appendix B), supplementary exposure limits for some specific agents (Appendix C), a list of substances with no established RELs (Appendix D), OSHA respirator requirements for selected chemicals (Appendix E), miscellaneous notes (Appendix F), and the 1989 proposed updates to the OSHA permissible exposure limits (Appendix G). Additional information is provided about respiratory protection designations and definitions regarding personal protection, sanitation, and first aid procedures.

The **Help** button sends the user to some instructions for using the app.

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The online (computer) version of the NPG can be accessed at <https://www.cdc.gov/niosh/npg/default.html>. It provides the same information as the mobile version, but the format is slightly different. The user can search for chemical in the field shown below. Alternatively, searches may be made using an index of chemical names, synonyms, trade names, CAS numbers, or RTECS numbers. The online version does not provide the option of bookmarking chemicals or reviewing your search history.

Search the *Online NIOSH Pocket Guide to Chemical Hazards*

Search

Enter search terms separated by spaces.

Index of Chemical Names,
Synonyms and Trade Names

Index of CAS Numbers

The NPG is also available as a PDF file at <https://www.cdc.gov/niosh/docs/2005-149/default.html>.

Technical information and assistance can be sought from NIOSH by phone by dialing 1-800-232-4636.

Getting the NIOSH Pocket Guide mobile app

For future reference, the NPG app can be downloaded onto various devices from the web page <https://www.cdc.gov/niosh/npg/mobilepocketguide.html>. This site can also be found by searching in a web browser using the terms “NIOSH Pocket Guide app”. Once you have reached the page, you will select “Download on the App Store” for Apple products or “Get it on Google Play” for android devices.

Exercise: Use the NIOSH Pocket Guide mobile app

The facilitator will provide an exposure scenario involving a hazardous material. Use the app to find information about the hazard and determine actions that are needed.

Complete the Worksheet provided and be prepared to share the decisions made in your group with the other participants.

Closing

Using the NIOSH Pocket Guide mobile app, did you:

- Gather information about a chemical hazard?
- Identify a chemical concentration that is immediately dangerous to life and health (IDLH)?
- Select a category of respiratory protection for a chemical exposure scenario?

How would you apply the information available in the NIOSH Pocket Guide mobile app?

How would you use the NIOSH Pocket Guide mobile app in conjunction with other resources?

Based on this exercise, what takeaways do you have for use of the NIOSH Pocket Guide mobile app in the future?

Please ask any remaining questions.

NOTE: The Midwest Consortium developed this guidance cooperative agreement number U45 ES 06184 from the National Institute of Environmental Health Sciences.