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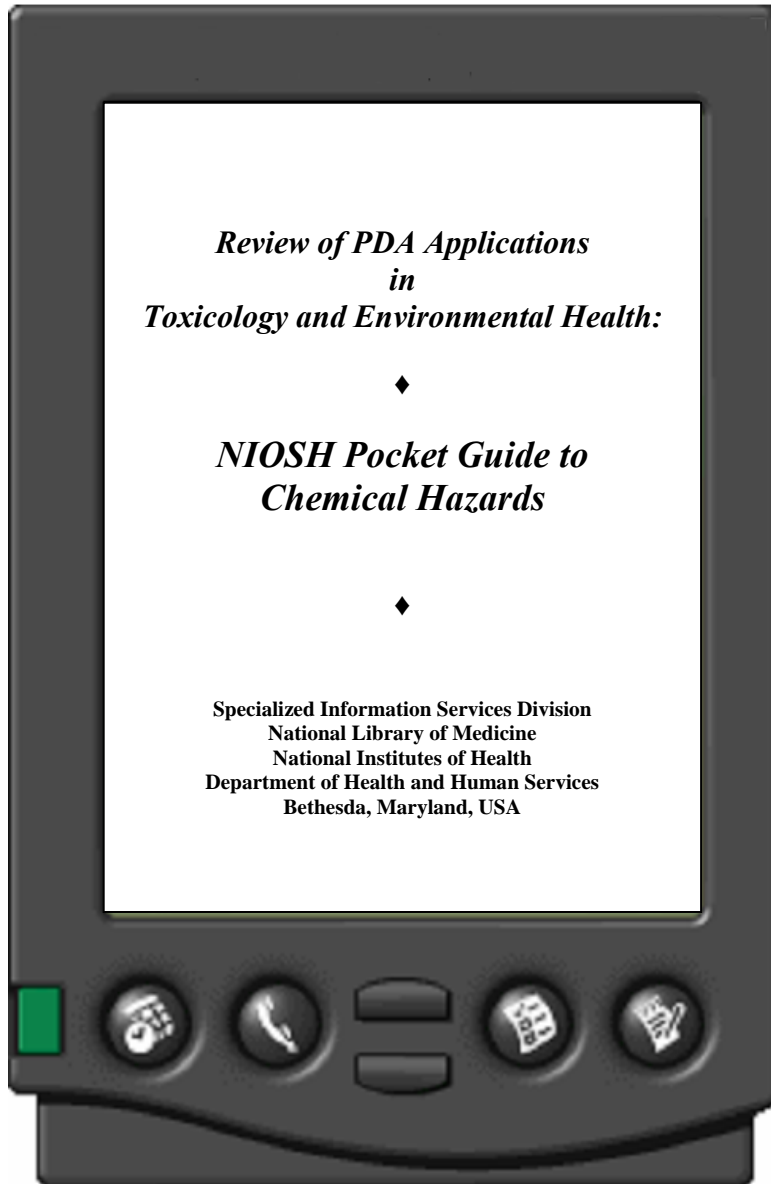
*Review of PDA Applications  
in  
Toxicology and Environmental Health:*



*NIOSH Pocket Guide to  
Chemical Hazards*



Specialized Information Services Division  
National Library of Medicine  
National Institutes of Health  
Department of Health and Human Services  
Bethesda, Maryland, USA



# ***NIOSH Pocket Guide to Chemical Hazards***

(Reviewed 07/2002)



## *General Information*

For general comments regarding the *Review of PDA Applications in Toxicology and Environmental Health*, please see the [Overview](#). Here we review the main technical and content features of the Palm OS version of the *NIOSH Pocket Guide to Chemical Hazards (1.1)* based upon a free, downloadable demo. The information it contains was taken exclusively from the online version, which is in the public domain and is available via the National Institute for Occupational Safety and Health (NIOSH) website. The data are based on the 1997 version of the printed *Pocket Guide* and reflect any online updates made by NIOSH through December 1999. This demo version of the *Pocket Guide* is fully functional, but omits chemical links and information for about one-third of the chemicals found in the full version.

## *Intended Users*

- Occupational Health/Safety Specialists
- Industrial Hygienists
- HazMat Personnel

## *Authorship/Data Source*

The data were obtained from a variety of sources, including NIOSH policy documents such as criteria documents and Current Intelligence Bulletins (CIBs), and recognized references in the fields of industrial hygiene, occupational medicine, toxicology, and analytical chemistry. The *Pocket Guide* is updated periodically to reflect new data regarding the toxicity of various substances and any changes in exposure standards or recommendations.

## Contents

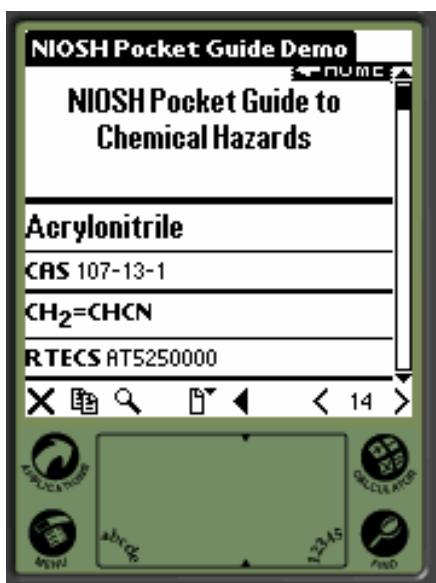
The *NIOSH Pocket Guide to Chemical Hazards* is intended as a source of general industrial hygiene information for workers, employers, and occupational health/safety professionals. It presents key information and data in abbreviated tabular form for 677 chemicals or substance groupings that are found in the work environment. The industrial hygiene information found in the *Pocket Guide* should help users recognize and control occupational chemical hazards. The chemicals or substances contained in this revision include all substances for which NIOSH has recommended exposure limits (RELs) and those with permissible exposure limits (PELs), as found in the Occupational Safety and Health Administration (OSHA) General Industry Air Contaminants Standard (29 CFR 1910.1000).

To maximize the amount of data provided in a limited amount of space, abbreviations, acronyms, and codes have been widely used. The *Pocket Guide* provides information for each substance under the following headings:

- ◆ Chemical Name
- ◆ CAS (Chemical Abstracts Service) Number
- ◆ Chemical Formula
- ◆ RTECS (Registry of Toxic Effects of Chemical Substances) Number
- ◆ Synonyms and Trade Names
- ◆ DOT ID (Department of Transportation Identification) and Guide Numbers
- ◆ Exposure Limits:
  - NIOSH REL (Recommended Exposure Limits)
  - OSHA PEL (Permissible Exposure Limits)
- ◆ IDLH (Immediately Dangerous to Life or Health) Concentrations
- ◆ Conversion Factors
- ◆ Physical Description
- ◆ Chemical and Physical Properties:
  - » MW → molecular weight
  - » BP → boiling point at 1 atmosphere, in °F
  - » Sol → solubility in water at 68 °F (unless a different temperature is noted), in % by weight (i.e., g/100 ml)
  - » Fl.P → flash point (i.e., the temperature at which the liquid phase gives off enough vapor to flash when exposed to an external ignition source), closed cup (unless annotated "(oc)" for open cup), in °F
  - » IP → ionization potential, in eV (electron volts) [Ionization potentials are given as a guideline for the selection of photoionization detector lamps used in some direct-reading instruments.]
  - » VP → vapor pressure at 68 °F (unless a different temperature is noted), in mmHg
  - » MLT → melting point for solids, in °F
  - » FRZ → freezing point for liquids and gases, in °F
  - » UEL → upper explosive (flammable) limit in air, in % by volume (at room temperature unless otherwise noted)
  - » LEL → lower explosive (flammable) limit in air, in % by volume (at room tem-

- perature unless otherwise noted)
- » MEC → minimum explosive concentration, in g/m<sup>3</sup> (when available)
  - » SpGr → specific gravity at 68 °F (unless a different temperature is noted) referenced to water at 39.2 °F (4 °C)
  - » RgasD → relative density of gases referenced to air = 1 (indicates how many times a gas is heavier than air at the same temperature)
  - » Flammability/Combustibility → when possible, the flammability/combustibility of a substance was determined and listed. OSHA criteria (29 CFR 1910.106) were used to classify flammable or combustible liquids.

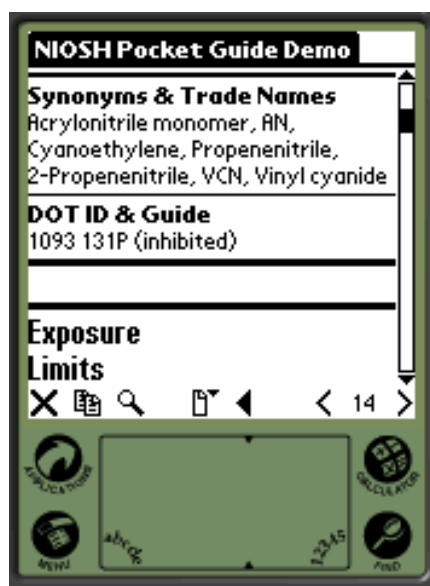
As an example, the Palm OS screen shots below show the above-mentioned sections for the chemical *Acrylonitrile*:

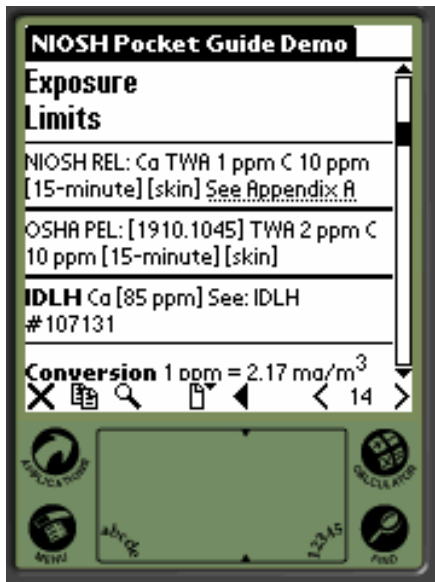


◀ *The Pocket Guide provides the chemical name, CAS number, chemical formula, and RTECS number for each substance. The chemical name, which is found in the OSHA General Industry Air Contaminants Standard, is always listed first. The CAS number, in the format xxx-xx-x, is unique for each chemical and allows efficient database searching. The RTECS number, in the ABxxxxxxx format, may be useful for obtaining additional toxicologic information on a specific substance.*

▶ *Synonyms & Trade Names are listed alphabetically for each substance.*

*The DOT ID & Guide numbers are provided in the format xxxx xxx. The DOT ID number (xxxx) indicates that the substance is regulated by DOT. The Guide number (xxx) refers to actions to be taken to stabilize an emergency situation; this information can be found in the 1996 North American Emergency Response Guidebook.*

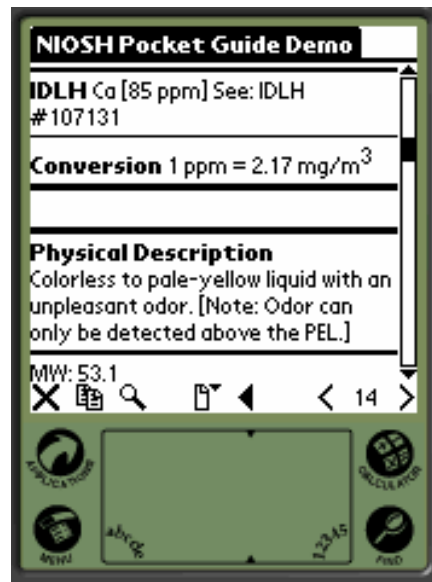




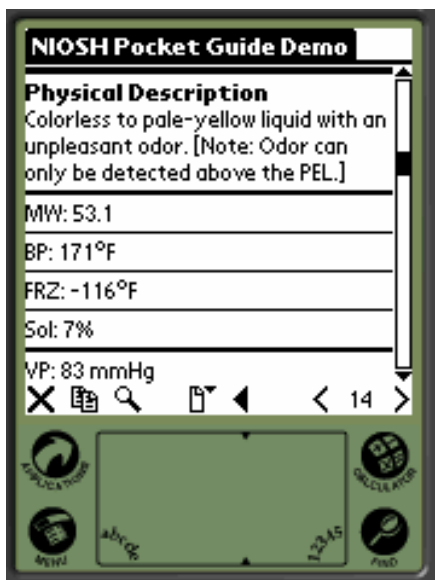
◀ *Under Exposure Limits, the NIOSH recommended exposure limits (REL) and the OSHA permissible exposure limits (PEL) are listed for each substance. REL and PEL values are typically time-weighted average (TWA) concentrations. Ceiling concentrations are designated by a "C" preceding the value. Concentrations are given in ppm, mg/m<sup>3</sup>, mppcf (millions of particles per cubic foot of air), or fibers/cm<sup>3</sup>. The [skin] designation indicates the potential for dermal absorption. Any substance NIOSH deems a potential occupational carcinogen is designated "Ca."*

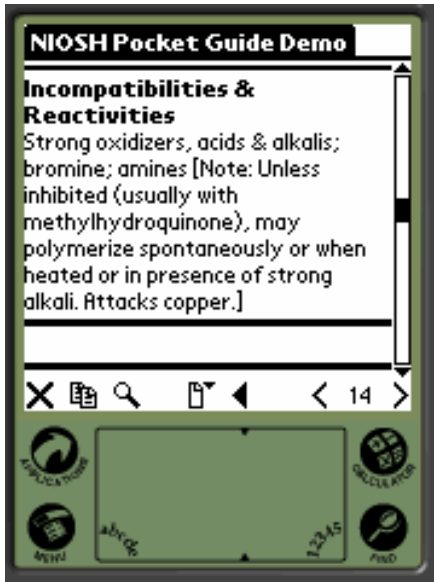
▶ *Immediately dangerous to life or health (IDLH) values are listed for over 380 substances. IDLH values originally determined in the Standards Completion Program or recently revised are shown in brackets.*

*Factors for the conversion of ppm (parts of vapor or gas per million parts of contaminated air by volume) to mg/m<sup>3</sup> (milligrams of vapor or gas per cubic meter of contaminated air) at 25 °C and 1 atm are listed for substances with exposure limits expressed in ppm.*



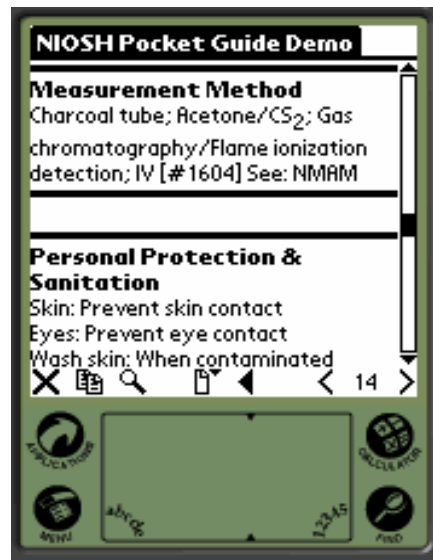
◀ *The Physical Description section provides a brief description of the appearance and odor of the substance. A description of the chemical and physical properties of the substance follows. For space-saving purposes, abbreviations, acronyms, and codes have been used to designate the various properties.*





◀ *The Incompatibilities & Reactivities section lists important hazardous incompatibilities or reactivities of the substance.*

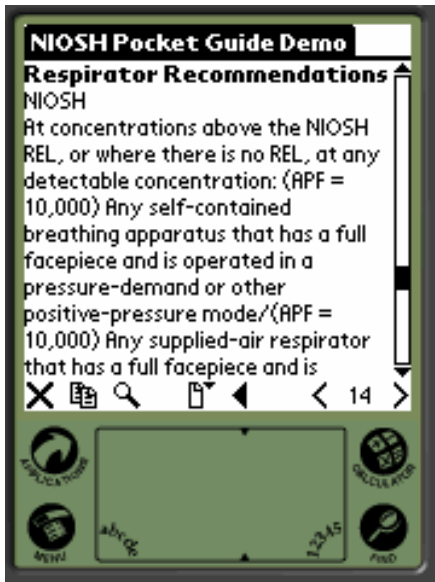
▶ *The Measurement Method section provides a brief, keyword-like description of the suggested sampling and analysis method. Each description comprises four components: (1) the collection method, (2) the sample work-up, (3) the analytical method, and (4) the method number. The method number is usually from the 4th edition of the NIOSH Manual of Analytical Methods and is indicated by a "IV" following the sample work-up.*



◀ *The Personal Protection & Sanitation section lists recommended practices for toxic substances. Categories included are:*

- \* *Skin (recommends the need for personal protective clothing)*
- \* *Eye (recommends the need for eye protection)*
- \* *Wash Skin (states when workers should wash the spilled chemical from the body in addition to normal washing)*
- \* *Remove (advises workers when to remove clothing that has accidentally become wet or significantly contaminated)*
- \* *Change (recommends whether the routine changing of clothing is needed)*
- \* *Provide (recommends the need for eyewash fountains and/or quick drench facilities)*

*First Aid provides links to emergency procedures for eye/skin contact with and inhalation/ingestion of toxic substances.*

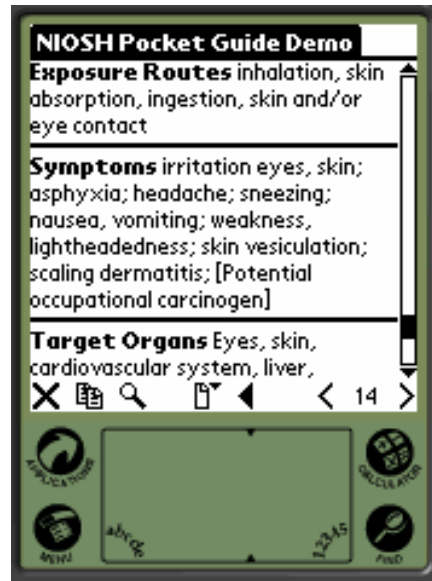


◀ *The Respirator Recommendations section provides a condensed table of allowable respirator use for substances with determined IDLH values. The first line indicates whether the NIOSH or OSHA exposure limit is used, whichever is more protective. 'NIOSH/OSHA' indicates that the limits are equivalent. Each subsequent line lists a maximum use concentration (MUC) followed by the classes of respirators, with their assigned protection factors (APFs), that are acceptable for use up to the MUC. Individual respirator classes are separated by diagonal lines (/).*

▶ *The Exposure Routes section lists the toxicologically important routes of entry for the substance and whether contact with the skin or eyes is potentially hazardous.*

*The Symptoms section lists the potential symptoms of exposure.*

*The Target Organs section lists the organs that are affected by exposure to the substance.*



◀ *The Pocket Guide also includes the following seven appendices:*

*Appendix A ~ NIOSH Potential Occupational Carcinogens*

*Appendix B ~ Thirteen OSHA-Regulated Carcinogens*

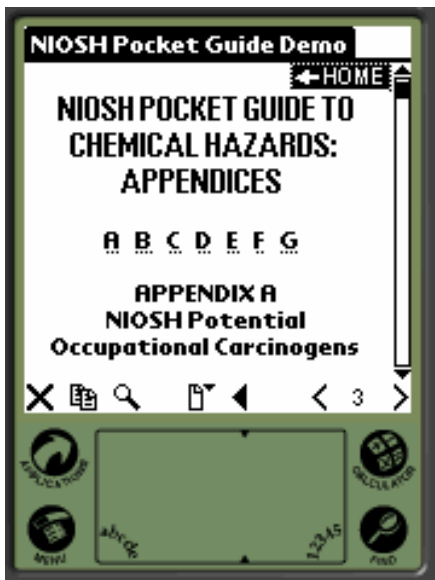
*Appendix C ~ Supplementary Exposure Limits*

*Appendix D ~ Substances with No Established RELs*

*Appendix E ~ Respirator Recommendations for Selected Chemicals*

*Appendix F ~ Miscellaneous Notes*

*Appendix G ~ 1989 Air Contaminants Update Project: Exposure Limits Not in Effect*



## Navigation

This is an application that functions in an offline mode and does not require any degree of mobile connectivity. The *iSilo™* reader is required to view the contents of the *NIOSH Pocket Guide to Chemical Hazards*. For detailed information on the *iSilo™* reader and its functionality and features, please visit the *iSilo™* website at [www.isilo.com](http://www.isilo.com).



◀ Once the document has been opened, the user will see a vertical scroll bar on the right-hand side of the screen. The first three icons from the left at the bottom of the screen are: ✕ (End ~ for exiting the program), ☰ (Copy ~ for highlighting text to be copied), and 🔍 (Find ~ for searching the document). The 🏠 icon can be used to navigate to the Home, Introduction, and Appendices sections (via pop-up menu). *iSilo™* also provides ◀▶ (forward/back) buttons to permit jumping to other pages. The page counter 1 > indicates the user's position within the document. The main screen also contains links to the individual sections of an A-to-Z index of chemical names and to a CAS # index. Links to introductory information and the Appendices are also included.

(Please note that employing a version of the *iSilo™* reader other than the one used by the application reviewed here will likely result in different screen displays and navigational features.)

## Requirements

- ❖ Palm OS (any version)
- ❖ 1.1 MB of RAM
- ❖ *iSilo™* reader 2.53

## Application Type/Price

- ❖ Shareware
- ❖ \$10.00 – *NIOSH Pocket Guide to Chemical Hazards*
- ❖ \$17.50 – *iSilo™* reader (single-user license)



### *Availability*

The *NIOSH Pocket Guide to Chemical Hazards* is available via its publisher (PocketIH Software, LLC) or directly from commercial PDA software distributors. The *iSilo*<sup>™</sup> reader is available from [iSilo.com](http://iSilo.com).

### *Useful Web Links*

For information about the publisher of the *NIOSH Pocket Guide to Chemical Hazards*, go to [www.pocketih.com](http://www.pocketih.com). For more information on *iSilo*<sup>™</sup>, visit [www.isilo.com](http://www.isilo.com). For information on NIOSH and other NIOSH publications, go to [www.cdc.gov/NIOSH](http://www.cdc.gov/NIOSH).

# **Review of PDA Applications in Toxicology and Environmental Health**

## **Overview**

Handheld computer devices known as Personal Digital Assistants (PDAs) are increasingly being used in the fields of toxicology and environmental health. Moreover, software applications covering specialized subject matter in these fields are increasingly being made available to PDA users.

In an effort to provide information on the main technical and content features of selected applications, the National Library of Medicine's Division of Specialized Information Services (SIS) has undertaken an ongoing review of them. Typically, individual reports in the review series are based on free, downloadable demos.

Each report typically covers the following topics: General Information, Intended Users, Authorship/Data Source, Contents, Navigation, Requirements, Application Type/Price, Availability, Useful Web Links, and Updates.



**Note:** The *Review of PDA Applications in Toxicology and Environmental Health* is not intended to be all comprehensive, but rather a review of selected applications. SIS staff welcomes any comments on completed reviews or suggestions for additional reviews of applications not currently included, as long as they fall within the scope of toxicology and environmental health. You may contact us via email at [tehip@tehnlm.nih.gov](mailto:tehip@tehnlm.nih.gov) with any comments, questions, or suggestions.

It is not the intention of SIS staff to recommend, or not recommend, any particular PDA device(s) or software application(s), but rather to provide an objective and descriptive review of the main technical and content features of selected applications based on their downloadable demo versions.

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