Examine Current Chemical Use

Step 2

Examine Current Chemical Use

Examine Current Chemical Use

Key Steps:

- **Identify** formulated products/chemicals used in all areas of the workplace.
- **Assess the hazards** posed by chemicals used in the workplace.
- **Set priorities** for most important chemicals to reduce or eliminate.

Identify Chemicals/Mixtures Used in Workplace

- **Inventory full range of worksite activities.**
  - Production
  - Service
  - Janitorial
  - Other
- **Examine chemical use in all steps of work processes.**
- **Identify potential exposures.**
  - Amounts of chemical used
  - Physical state of chemical (e.g., aerosol, liquid) during potential exposure

Steps in Compiling Inventory

- **Make a list of all the activities in the workplace that use chemicals (including products).**
- **Do walk-through of the facility/worksite.**
- **Obtain any available data on worker exposure.**
- **Review Safety Data Sheets (SDSs) for all mixtures/products/individual chemicals.**

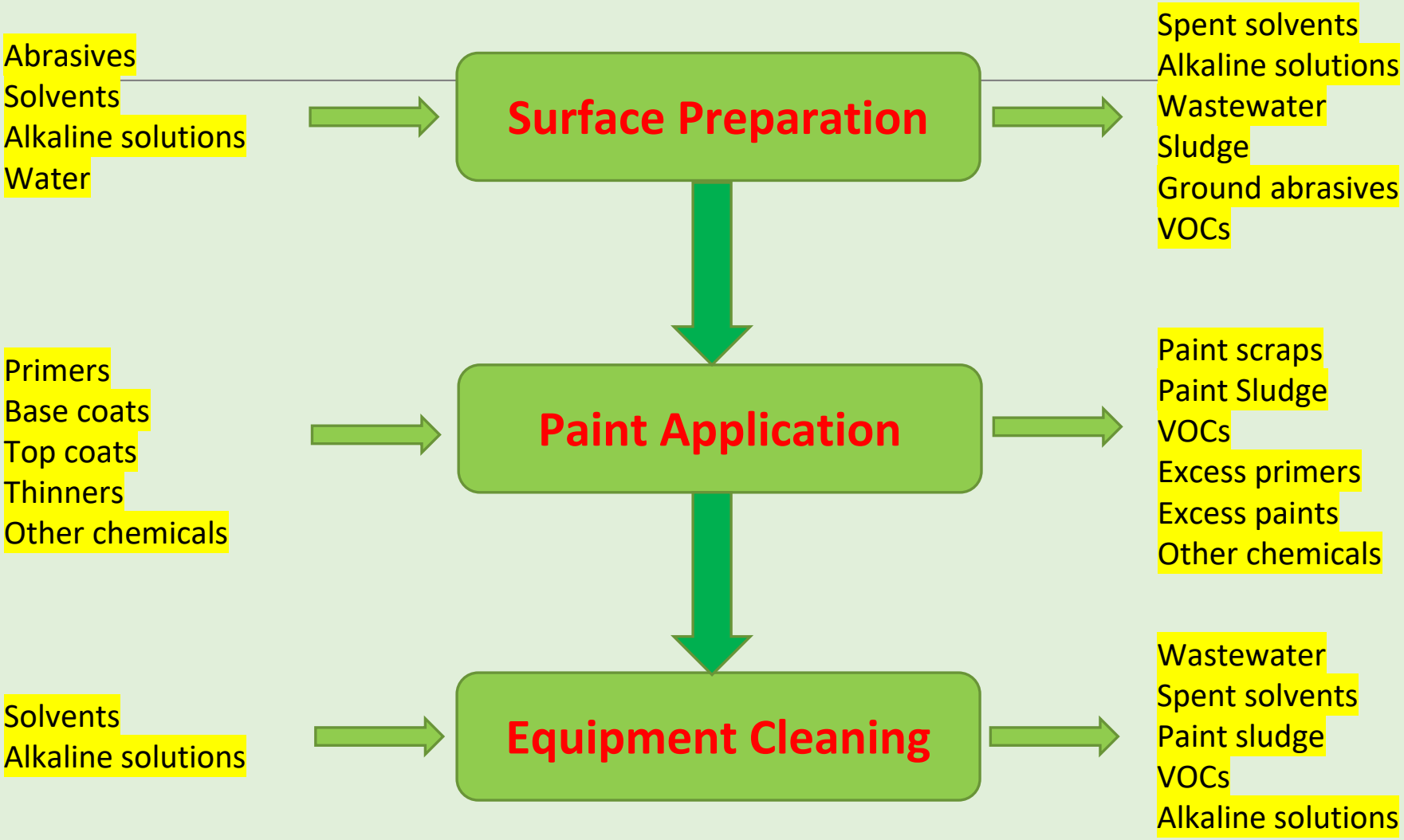
Process Flowcharts

- Valuable tool for visualizing the flow of work or materials in workplace.
- Demonstrates key use and movement of chemicals for each process step.
- Facilitates gathering of data on:
  - Mixtures/chemicals used
  - Volumes of each
  - Hazards of chemicals

Process Flow Charts Allow Systematic Review of:

- Chemicals used in each process step.
- Functions of chemicals.
- Whether chemical essential to function.
- Hazards associated with chemicals.
- Chemical wastes from process steps.
- Potential exposures/health risks for workers from chemicals used or discharged at each step of process.

FLOW CHARTS


Abrasives
Solvents
Alkaline solutions
Water
Surface Preparation
Spent solvents
Alkaline solutions
Wastewater
Sludge
Ground abrasives
VOCs
Primers
Base coats
Top coats
Thinners
Other chemicals
Paint Application
Paint scraps
Paint Sludge
VOCs
Excess primers
Excess paints
Other chemicals
Solvents
Alkaline solutions
Equipment Cleaning
Wastewater
Spent solvents
Paint sludge
VOCs
Alkaline solutions

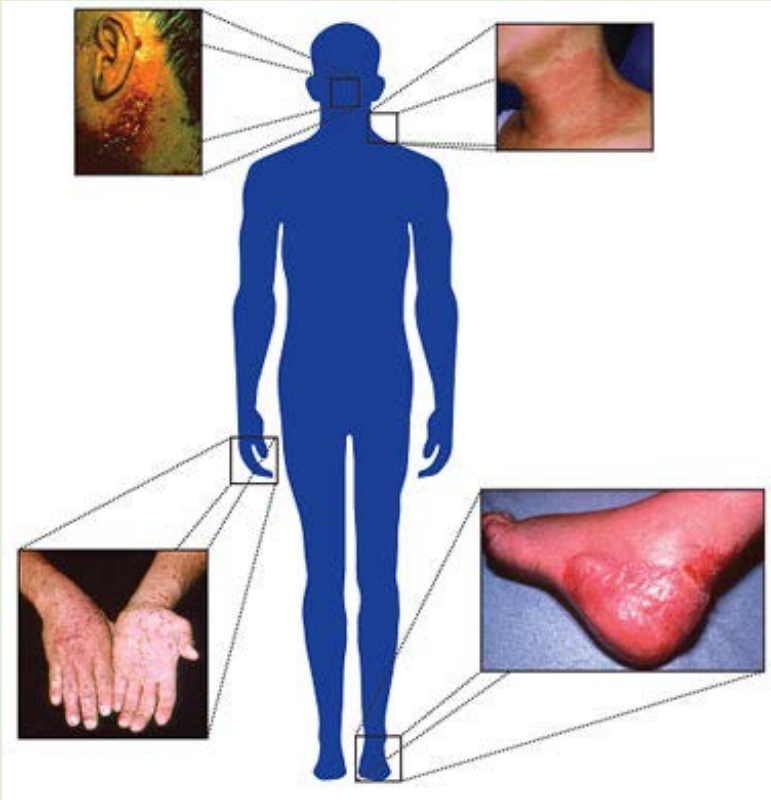
How Hazardous Is Each Input?

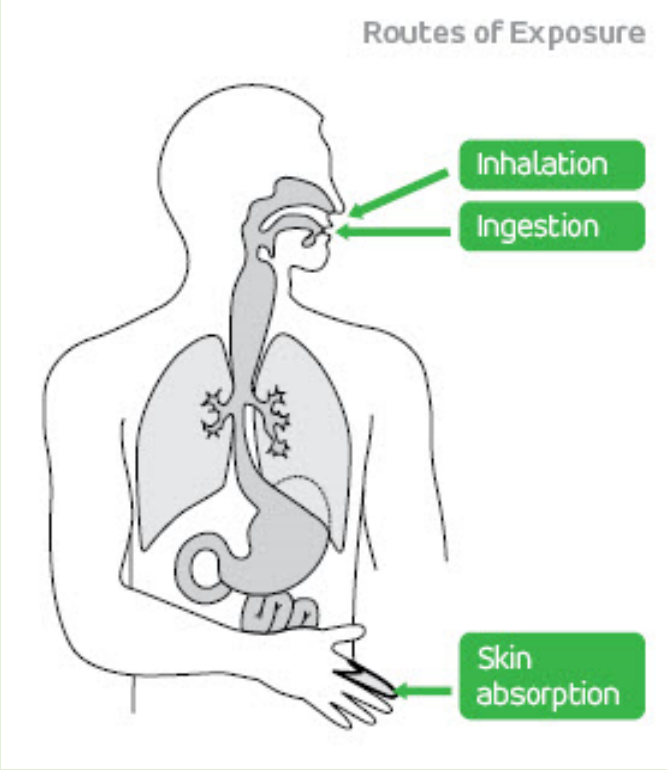
Methylene Chloride and Bathtubs: A Dangerous Combination

https://www.youtube.com/watch?time_continue=4&v=iQtd41JcMGg

Importance of Inventory

Short-Term Health Impacts





Look at Safety Data Sheet

1. Identification
2. Hazard(s) identification
3. Composition/information on ingredients
4. First aid measures
5. Firefighting measures
6. Accidental release measures
7. Handling and storage
8. Exposure control/personal protection
9. Physical and chemical properties
10. Stability and reactivity
11. Toxicological information
12. Ecological information
13. Disposal considerations
14. Transport information
15. Regulatory information
16. Other information

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 4), H227
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Inhalation (Category 3), H331
Acute toxicity, Dermal (Category 3), H311
Skin corrosion (Category 1B), H314
Serious eye damage (Category 1), H318
Skin sensitisation (Category 1), H317
Germ cell mutagenicity (Category 2), H341
Carcinogenicity (Category 1A), H350
Specific target organ toxicity - single exposure (Category 1), H370
Acute aquatic toxicity (Category 3), H402

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word	Danger
Hazard statement(s)	
H227	Combustible liquid.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled
H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H341	Suspected of causing genetic defects.
H350	May cause cancer.

New Tool to Supplement SDS

ChemHAT PPT…

http://chemhat.org/en

BLUEGREEN ALLIANCE

The BlueGreen Alliance is a national, strategic partnership between labor unions and environmental organizations dedicated to expanding the number and quality of jobs in the green economy.

Development of ChemHAT

How can we build a conversation among workers about the problems with chemicals and using **safer chemicals**?

Where do workers learn about chemicals and what resources do they use?

Development of ChemHAT

Your Health and Safety Committee has decided to convince your company to switch from using a dangerous chemical to a safer alternative.

What information would you need to help you get your employer switch to a safer chemical?

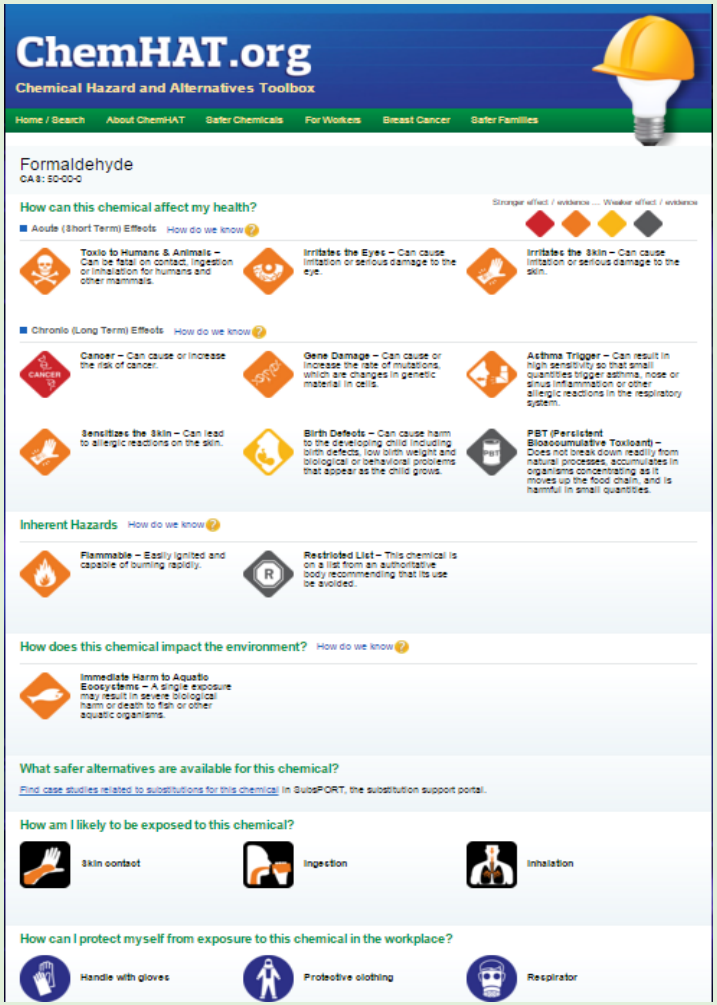
Development of ChemHAT

Stakeholder Input

- **Initial Idea**
  - The Industrial Division of the Communications Workers of America (IUE-CWA) and the BlueGreen Alliance reviewed existing databases and discussed how to make data on chemical hazards easily available

- **Input on Design and Content**
  - Members of the IUE-CWA, United Steelworkers, United Auto Workers and a group of worker trainers from the NIEHS Worker Education and Training program said they wanted
    - **Simple, searchable, clear**
    - **Impacts, common uses, exposure pathways**
    - **Worst hazards; alternatives information**

ChemHAT



- Health and Environmental impacts
- Common exposures
- General PPE
- Link to safer alternatives for some chemicals

Multiple Health Impacts

PBT (Persistent Bioaccumulative Toxicant) – Does not break down readily from natural processes, accumulates in organisms concentrating as it moves up the food chain, and is harmful in small quantities.

Cancer – Can cause or increase the risk of cancer.

Breast Cancer – Known to increase mammary gland tumors in animals.

Birth Defects – Can cause harm to the developing child including birth defects, low birth weight and biological or behavioral problems that appear as the child grows.

Reproductive Harm – Can disrupt the male or female reproductive systems, changing sexual development, behavior or functions, decreasing fertility, or resulting in loss of the fetus during pregnancy.

Endocrine Disruption – Can interfere with hormone communication between cells which controls metabolism, development, growth, reproduction and behavior (the endocrine system).

Gene Damage – Can cause or increase the rate of mutations, which are changes in genetic material in cells.

Asthma Trigger – Can result in high sensitivity so that small quantities trigger asthma, nose or sinus inflammation or other allergic reactions in the respiratory system.

Brain/Nervous System Harm – Can cause damage to the nervous system including the brain.

Toxic to Humans & Animals – Can be fatal on contact, ingestion or inhalation for humans and other mammals.

Other Health Effects – Can cause serious damage on contact or ingestion.

Irritates the Eyes – Can cause irritation or serious damage to the eye.

Weaker effect/evidence **Stronger effect/evidence**

Irritates the Skin – Can cause irritation or serious damage to the skin.

Sensitizes the Skin – Can lead to allergic reactions on the skin.

Flammable – Easily ignited and capable of burning rapidly.

Reactive – May spontaneously ignite or explode on its own or in contact with water.

Restricted List – This chemical is on a list from an authoritative body recommending that its use be avoided.

Immediate Harm to Aquatic Ecosystems – A single exposure may result in severe biological harm or death to fish or other aquatic organisms.

Long-Term Harm to Aquatic Ecosystems – Long term exposure may result in irreversible harm to fish or other aquatic organisms.

Harmful to Land Ecosystems – Can cause harm to land based plants, animals or microorganisms.

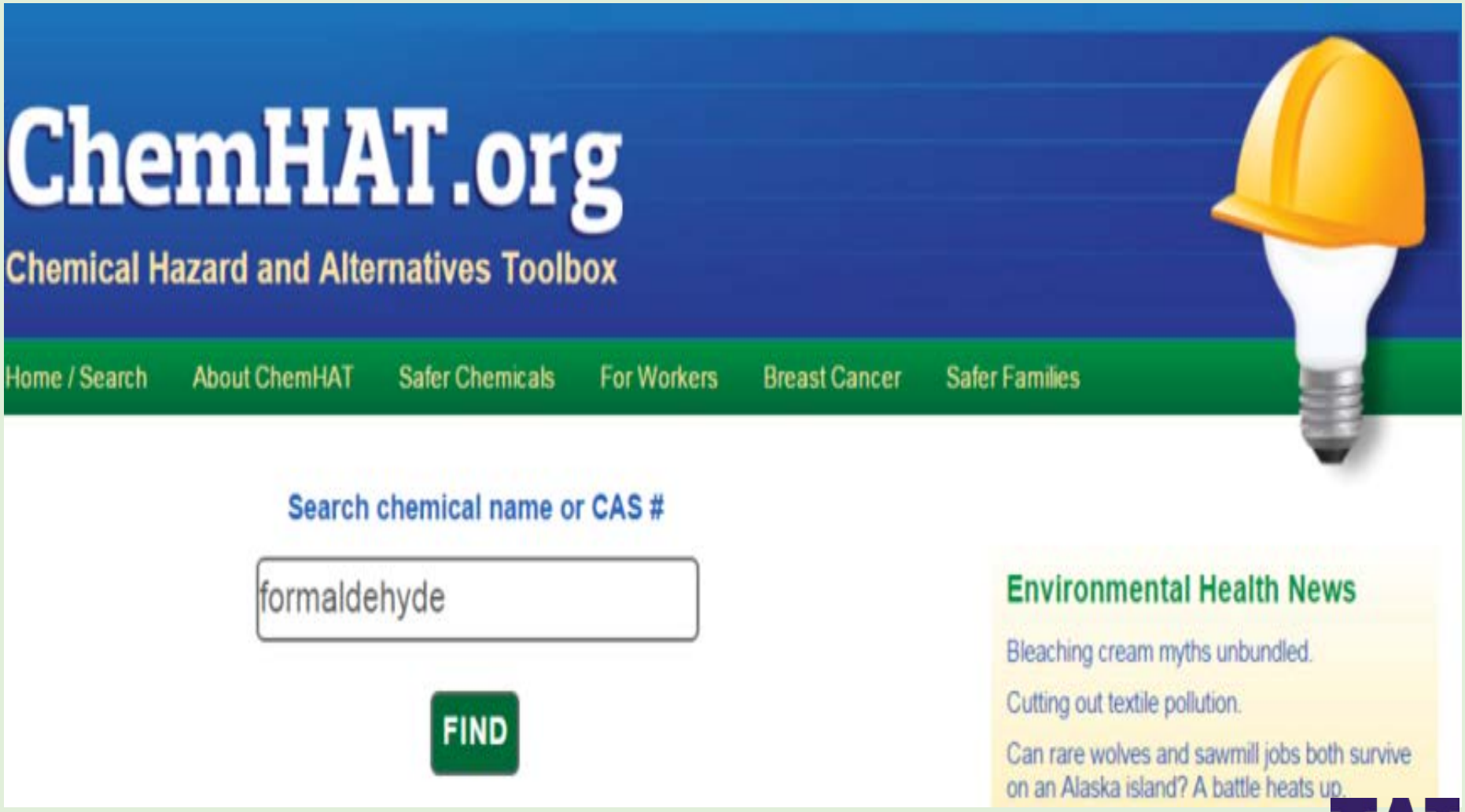
Climate Change – Contributes to the greenhouse effect or traps heat in the atmosphere, causing temperature changes and contributing to climate change.

Ozone Depletion – Can contribute to chemical reactions that destroy ozone in the earth's upper atmosphere.

Persistent – Does not break down readily from natural processes.

Bioaccumulative – Accumulates in organisms, concentrating as it moves up the food chain.

ChemHAT


ChemHAT.org
Chemical Hazard and Alternatives Toolbox
Home / Search
About ChemHAT
Safer Chemicals
For Workers
Breast Cancer
Safer Families
Search chemical name or CAS #
formaldehyde
FIND
Environmental Health News
Bleaching cream myths unbundled.
Cutting out textile pollution.
Can rare wolves and sawmill jobs both survive on an Alaska island? A battle heats up.

ChemHAT.org

Chemical Hazard and Alternatives Toolbox

Home / Search | About ChemHAT | Safer Chemicals | For Workers | Breast Cancer | Safer Families

Formaldehyde

CAS: 50-00-0

How can this chemical affect my health?

Stronger effect / evidence .... Weaker effect / evidence

Acute (Short Term) Effects How do we know

- **Toxic to Humans & Animals** – Can be fatal on contact, ingestion or inhalation for humans and other mammals.
- **Irritates the Eyes** – Can cause irritation or serious damage to the eye.
- **Irritates the Skin** – Can cause irritation or serious damage to the skin.

Chronic (Long Term) Effects How do we know

- **Cancer** – Can cause or increase the risk of cancer.
- **Gene Damage** – Can cause or increase the rate of mutations, which are changes in genetic material in cells.
- **Asthma Trigger** – Can result in high sensitivity so that small quantities trigger asthma, nose or sinus inflammation or other allergic reactions in the respiratory system.
- **Sensitizes the Skin** – Can lead to allergic reactions on the skin.
- **Birth Defects** – Can cause harm to the developing child including birth defects, low birth weight and biological or behavioral problems that appear as the child grows.
- **PBT (Persistent Bioaccumulative Toxicant)** – Does not break down readily from natural processes, accumulates in organisms concentrating as it moves up the food chain, and is harmful in small quantities.

Inherent Hazards How do we know

- **Flammable** – Easily ignited and capable of burning rapidly.
- **Restricted List** – This chemical is on a list from an authoritative body recommending that its use be avoided.

How does this chemical impact the environment? How do we know

- **Immediate Harm to Aquatic Ecosystems** – A single exposure may result in severe biological harm or death to fish or other aquatic organisms.

What safer alternatives are available for this chemical?

Find case studies related to substitutions for this chemical in SubsPORT, the substitution support portal.

How am I likely to be exposed to this chemical?

- Skin contact
- Ingestion
- Inhalation

How can I protect myself from exposure to this chemical in the workplace?

- Handle with gloves
- Protective clothing
- Respirator

How can this chemical affect my health?

Stronger effect / evidence ... Weaker effect / evidence

Acute (Short Term) Effects

How do we know

Toxic to Humans & Animals – Can be fatal on contact, ingestion or inhalation for humans and other mammals.

Irritates the Eyes – Can cause irritation or serious damage to the eye.

Irritates the Skin – Can cause irritation or serious damage to the skin.

Chronic (Long Term) Effects

How do we know

Cancer – Can cause or increase the risk of cancer.

Gene Damage – Can cause or increase the rate of mutations, which are changes in genetic material in cells.

Asthma Trigger – Can result in high sensitivity so that small quantities trigger asthma, nose or sinus inflammation or other allergic reactions in the respiratory system.

Sensitizes the Skin – Can lead to allergic reactions on the skin.

Birth Defects – Can cause harm to the developing child including birth defects, low birth weight and biological or behavioral problems that appear as the child grows.

PBT (Persistent Bioaccumulative Toxicant) – Does not break down readily from natural processes, accumulates in organisms concentrating as it moves up the food chain, and is harmful in small quantities.

Inherent Hazards

How do we know

Flammable – Easily ignited and capable of burning rapidly.

Restricted List – This chemical is on a list from an authoritative body recommending that its use be avoided.

Data sources:

Cancer

International Agency for Research on Cancer, World Health Organization

Monographs On the Evaluation of Carcinogenic Risks to Humans

Group 1: Agent is carcinogenic to humans

US Dept of Health & Human Services

Report on Carcinogens

Known to be Human Carcinogen

US Environmental Protection Agency

Integrated Risk Information System Database (IRIS)

(1986) Group B1 - Probable human carcinogen

State of California Environmental Protection Agency

Chemicals Known to the State to Cause Cancer or Reproductive Toxicity - California Proposition 65 - Safe Drinking Water and Toxic Enforcement Act Of 1986

Cancer

US Centers for Disease Control

NIOSH Carcinogen List

Occupational carcinogen

Republic of Korea - National Institute of Environmental Research

GHS Classification and Labelling for Toxic Chemicals

Carcinogenicity - Category 1 [H350 - May cause cancer]

Government of Japan

GHS Classifications

Carcinogenicity - Category 1A

Small Group Exercise: Using SDSs and ChemHAT

- **Use SDS to identify**
  - Ingredients of the formulation
  - Health hazards (acute/immediate, chronic)
  - Physical hazards
  - Routes of exposure
  - Precautions for working with a methylene chloride stripper
  - Health-based regulatory limits
- **Use ChemHAT to identify**
  - Health hazards (acute/immediate, chronic)
  - Physical hazards
  - Routes of exposure
  - Precautions for working with the chemical ingredient
  - Inclusion on restricted lists
  - Availability of safer alternatives

Putting It Together

- **First use the SDS to:**
  - Identify hazardous constituents and percent in product
  - Get information on health hazards and exposure potentials
  - Find out how to reduce exposure risks
  - Learn about OSHA and other regulatory restrictions

- **Then go to ChemHAT to:**
  - Get more comprehensive information on hazards (e.g., endocrine disruption), exposures for individual chemicals
  - Identify additional sources of information for hazards, safer alternatives

Full Group Discussion: Using SDSs and ChemHAT

- What important information did you learn from the SDS that was not in ChemHAT?
- What additional information did you learn from ChemHAT that was not in the SDS?
- Based on what you found on the SDS and in ChemHAT would you recommend continued use of this stripper?

What other Resources do you use for Hazard Identification / Recognition?

Healthy Building Network. Pharos. (https://www.pharosproject.net/)

Interstate Chemicals Clearinghouse (IC2). http://theic2.org/hazard-assessment .

AIHA- WEEL (www.aiha.org) WEELs

CDC ATSDR (www.atsdr.cdc.gov)

GreenScreen® (http://www.greenscreenchemicals.org/)

U.S. National Library of Medicine. TOXNET: Toxicology Data Network. (http://toxnet.nlm.nih.gov/index.html)

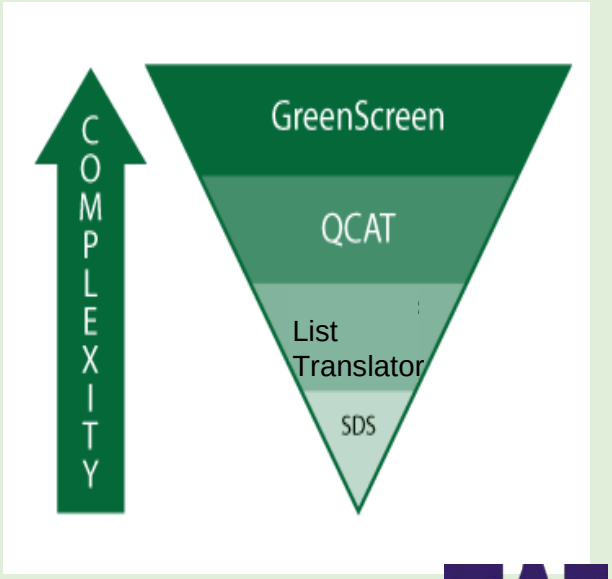
ChemSec. SIN (Substitute It Now!) List. (http://sinlist.chemsec.org/)

Dutch Ministry of Housing, Spatial Planning and Environment.

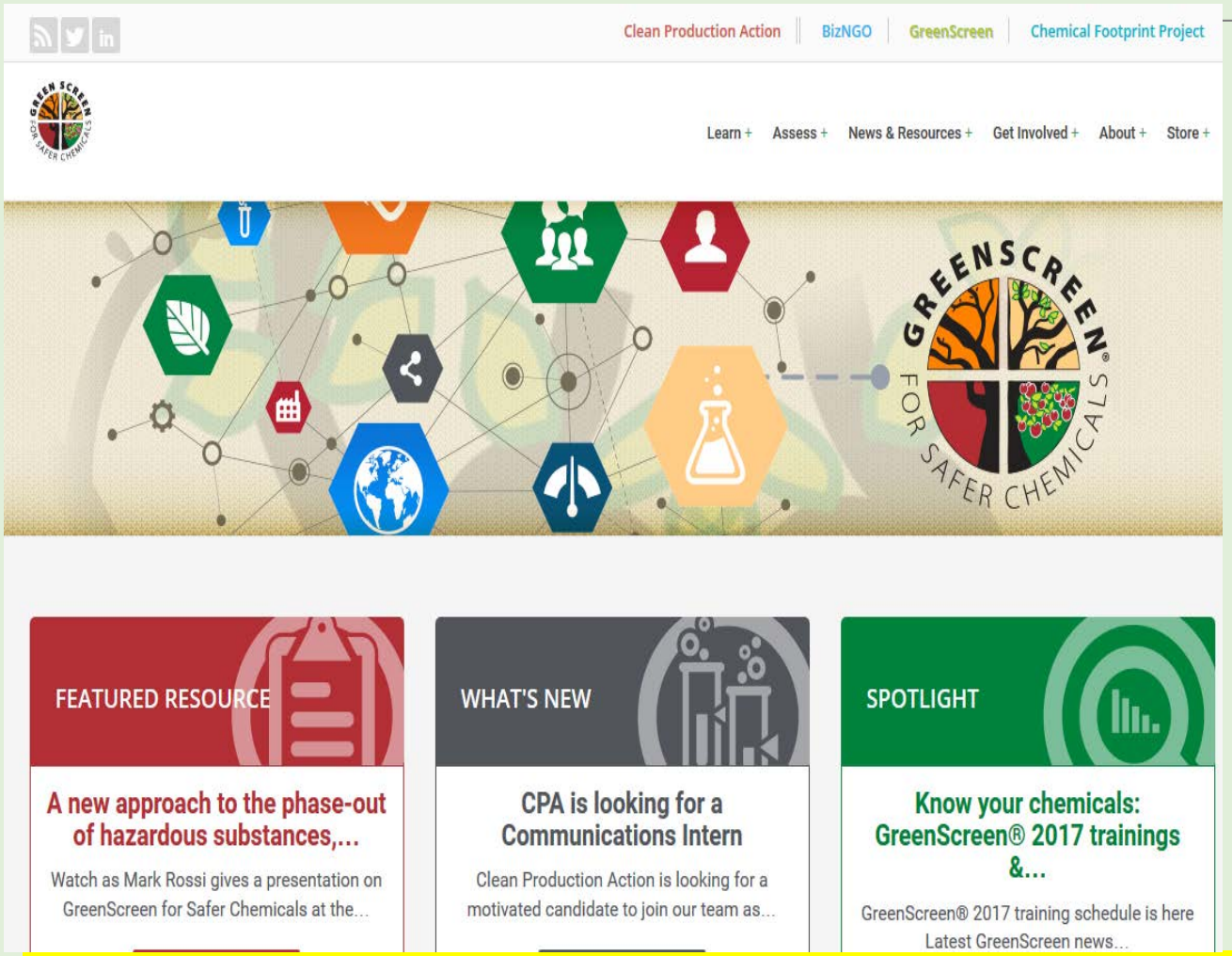
European Chemicals Agency (ECHA). Classification and Labeling Inventory Database.

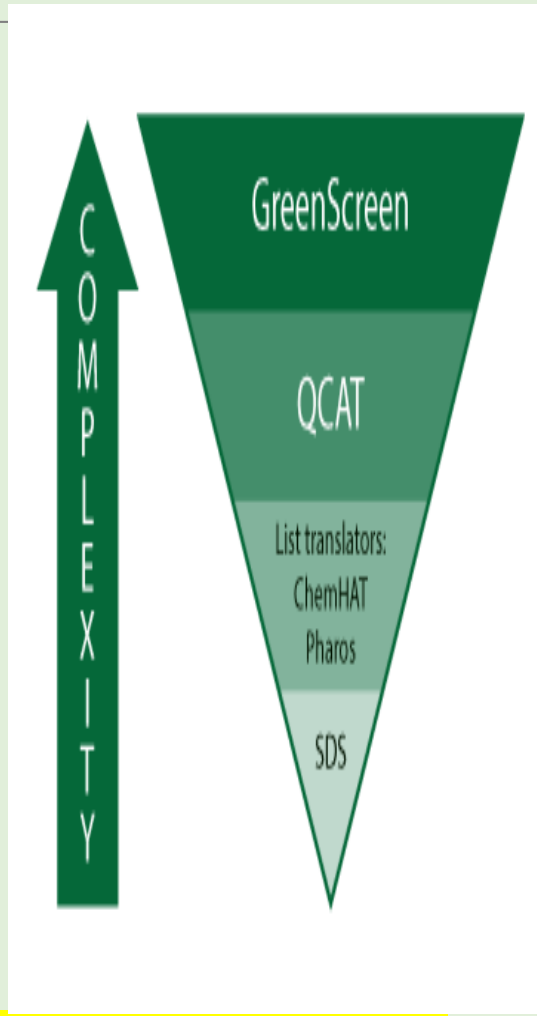
Other Examples of Chemical Hazard Assessments

- Automated GreenScreen® + List Translators
  - Pharos (Free)
  - ToxNot (Free)
- SciveraLENS Rapid Screen
- Quick Chemical Assessment Tool (QCAT)
- P2OAsys
- CleanGredients (Low Fee)
- GreenScreen®
- Cradle to Cradle



List Translator: Pharos





http://www.greenscreenchemicals.org/method/pharos

Setting Priorities: What Matters Most?

Major Team responsibility: deciding which transitions to safer alternatives are most critical and why.

- Which hazards most critical?
- What hazard(s) should be eliminated first?
- What uses of chemicals are of greatest concern?
- Could a chemical or process change improve workplace health?

- Are there tradeoffs between potential changes, and how should those be treated?
- Are there potential changes for which the Team can make a strong business case to management?

Summary and Review

- In this lesson, we learned how to examine current chemical use, which includes:
  - **Identifying** chemicals used in all areas of the workplace.
  - **Assessing the hazards** posed by chemicals used in the workplace.
  - **Setting priorities** for the most important chemicals to reduce or eliminate.