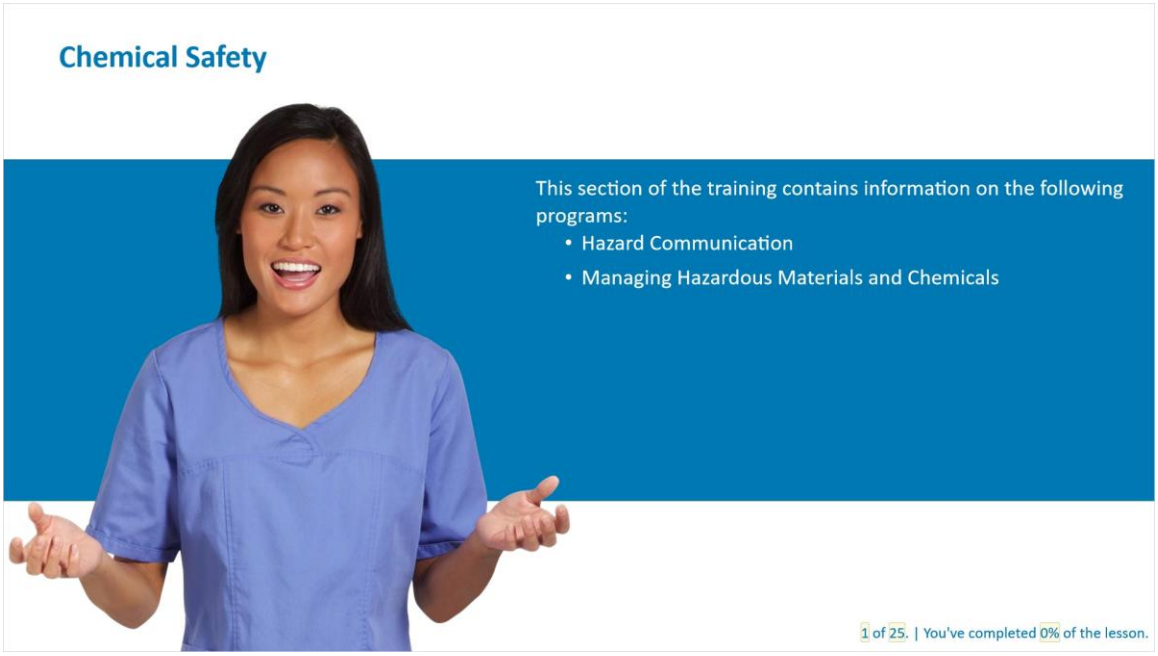
Chemical Safety

1. Chemical Safety

1.1 Chemical Safety



2. Hazard Communication

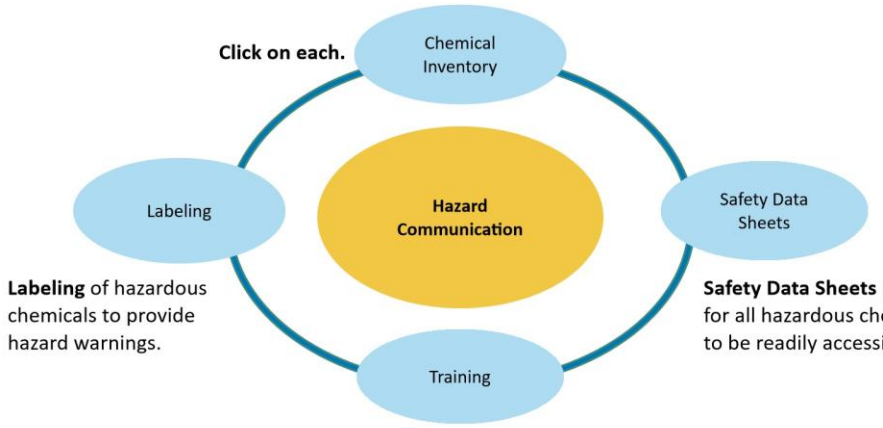
2.1 Hazard Communications Standard

Hazard Communications Standard

The OSHA Hazard Communication Standard requires the employer to develop a written hazard communication program for the workplace, which should cover:

Identification of chemicals in the work area.

Click on each.



Labeling of hazardous chemicals to provide hazard warnings.

Safety Data Sheets (SDS) for all hazardous chemicals to be readily accessible.

Training to be provided to all staff exposed to hazardous chemicals.

2 of 25. | You've completed 0% of the lesson.

2.2 Right to Know

Right to Know

Under the Hazard Communication Standard, you have the "Right To Know".....

- All of the operations in your work area where hazardous chemicals are present, and the proper protective measure to safely work with these chemicals including:
  - Appropriate personal protective equipment (PPE) needed when using each chemical
  - Where emergency equipment is located (safety showers, eyewash stations, alarm pulls, fire extinguishers, spill kits)
- How to access chemical inventories for your work location.
- How to access the Safety Data Sheets (SDS) for these chemicals.
- How to access a copy of your facility's written Hazard Communication Program.

3 of 25. | You've completed 0% of the lesson.

2.3 CALIFORNIA ONLY: Employee Rights in California, Proposition 65

CALIFORNIA ONLY: Employee Rights in California, Proposition 65

California requires that employees are informed of their right:

- To receive information about hazardous substances in their work environment.
- For their physician or collective bargaining agent to receive that information.
- Against discharge or other discrimination due to the employee's exercise of these rights.
- To receive updated information on a timely basis when a new or revised safety data sheet is received. This must be within 30 days if the new information indicates significantly increased risks.

Proposition 65 requires the state to publish a list of chemicals that are known to cause cancer, birth defects or other reproductive harm. That list is available on the California EPA web site.

Examples of listed chemicals in health care include cadmium, bis-phenol A (BPA) and some chemotherapy agents. Prop. 65 also requires that warnings appear on the label of listed products and that warning signs in the workplace be posted in conspicuous places where they're likely to be read and understood.

For questions regarding Prop. 65, contact your facility's EH&S department.

4 of 25. | You've completed 0% of the lesson.

2.4 Labeling System

Labeling System

One of the ways to find out about the hazards of the chemicals that you work with is by reviewing the container labels.

There are two types of container labels:

- **Primary Labels** are those which are attached to the product's original container and provided by the manufacturer/distributors.
- **Secondary Labels** are those that you or your department attaches to the smaller container after a hazardous chemicals is transferred from the original container.

It's important that all chemical containers are labeled.

5 of 25. | You've completed 0% of the lesson.

2.5 Labeling Systems: Primary and Secondary Labels

Labeling Systems: Primary and Secondary Labels

Click on each button.

Primary Label

Secondary Label

6 of 25. | You've completed 0% of the lesson.

Primary Label (Slide Layer)

Labeling Systems: Primary and Secondary Labels

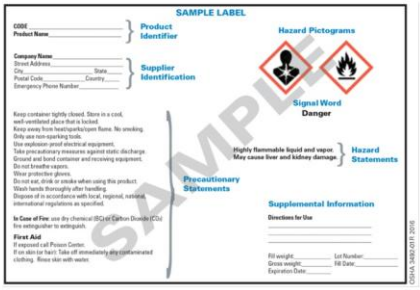
Click on each button.

Primary Label

Secondary Label

Primary Labels include:

- Product identifier (name of chemical);
- Signal word, either “danger" or "warning.
- Hazard statement(s) - Standardized and assigned phrases that describe the hazard(s) as determined by hazard classification.
- Pictogram(s)
- Precautionary statement(s) – for Prevention, Response, Storage and Disposal.
- Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party.



Click image to enlarge

6 of 25. | You've completed 0% of the lesson.

Secondary Label (Slide Layer)

Labeling Systems: Primary and Secondary Labels

Click on each button.

Primary Label

Secondary Label

The **secondary container labels** must include the following:

- Product identifier and
- Words, pictures, symbols, or a combination providing "general" information regarding the hazards of the chemicals.

Note: The original manufacturer's label and SDS are used as sources of information.

6 of 25. | You've completed 0% of the lesson.

2.6 Globally Harmonized System (GHS)

Globally Harmonized System (GHS)

Standard pictograms are used as part of the international Globally Harmonized System (GHS) of classification and labeling of hazards.

Hazardous chemicals in the manufacturer's original container will have these symbols on them to quickly show hazard information without words.

Chemicals may have physical or health hazards. Some chemicals may have more than one type of hazard.

Next we will show the pictograms.

7 of 25. | You've completed 0% of the lesson.

2.7 Pictograms and Hazards

Pictograms and Hazards

The types of hazardous chemicals you may work with depends on the operations in your work area. Hazards can be physical or health hazards, and some chemicals may have more than one hazard.

Health Hazard
formalin, methanol, certain metals (arsenic, cadmium, chromium)

Flammables
alcohol based hand gel or foam, alcohol prep pad (95% isopropyl alcohol)

Exclamation Mark
ammonia, formalin, sulfur dioxide

Gases under pressure
medical gas, nitrogen, oxygen

Corrosion
acetic acid, glacial (100%, bleach (5% sodium hypochlorite)

Exploding Bomb
powered cartridges for tools

Oxidizers
nitrous oxide, oxygen silver nitrate

Aquatic toxicity
chemical like mercury or lead enters a water body and harms aquatic organisms like fish

Skull and Crossbones
methanol, denatured alcohol, steris s-40 concentrate

8 of 25. | You've completed 0% of the lesson.

2.8 Safety Data Sheets (SDS) and Chemical Inventories

Safety Data Sheets (SDS) and Chemical Inventories

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Section 13: Disposal considerations
Section 14: Transport information
Section 15: Regulatory information
Section 16: Other information

Use mouse to hover over the different sections of the SDS to see an example of the information provided in that section.

9 of 25. | You've completed 0% of the lesson.

Section 1, Identification (Slide Layer)

Safety Data Sheets (SDS) and Chemical Inventories

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Section 16: Other information

Section 1: Identification - identifies the chemical on the SDS as well as its intended use. It also provides the essential contact information of the supplier.

1. Identification

Product Name	**Formalin, Buffered, 10%**
Cat No. :	**SF99-4; SF99-20**
Synonyms	Formaldehyde solution, buffered (Acetate Buffer/Certified)
Recommended Use **Uses advised against**	Laboratory chemicals. Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company
Fisher Scientific Company
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number	CHEMTREC®, Inside the USA: 800-424-9300 CHEMTREC®, Outside the USA: 001-703-527-3887

9 of 25. | You've completed 0% of the lesson.

Section 2, Hazards identification (Slide Layer)

Safety Data Sheets (SDS) and Chemical Inventories

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Section 15: Regulatory information
Section 16: Other information

Section 2: Hazard(s) Identification - outlines the hazards of the chemical and appropriate warning information.

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 4
Skin Corrosion/Irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Skin Sensitization	Category 1
Germ Cell Mutagenicity	Category 2
Carcinogenicity	Category 1A
Specific target organ toxicity (single exposure)	Category 1
Target Organs - Respiratory system, Central nervous system (CNS), Optic nerve.	
Specific target organ toxicity - (repeated exposure)	Category 2
Target Organs - Kidney, Liver, Blood.	

9 of 25. | You've completed 0% of the lesson.

Section 3, Composition/informatioon on ingredients (Slide Layer)

Safety Data Sheets (SDS) and Chemical Inventories

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Section 16: Other information

Section 3: Composition/Information on ingredients - identifies the ingredient(s) of the chemical product identified on the SDS, including impurities and stabilizing additives.

3. Composition/Information on Ingredients

Component	CAS No	Weight %
Water	7732-18-5	82 - 82.9
Formaldehyde	50-00-0	3.9 - 4.0
Sodium acetate	127-09-3	1.2 - 2.0
Methyl alcohol	67-56-1	2

9 of 25. | You've completed 0% of the lesson.

Section 4, First-aid measures (Slide Layer)

Safety Data Sheets (SDS) and Chemical Inventories

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Section 15: Regulatory information
Section 16: Other information

Section 4: First-aid Measures - describes the initial treatment protocol for untrained responders to incidents of chemical exposure.

4. First-aid measures

General Advice	Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.
Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists: Get medical advice/attention.
Skin Contact	Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.
Inhalation	Remove to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required.
Ingestion	Do NOT induce vomiting. Call a physician or poison control center immediately.
Most important symptoms and effects	Difficulty in breathing. May cause allergic skin reaction. . Irritating to eyes. Irritating to skin. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing
Notes to Physician	Treat symptomatically

9 of 25. | You've completed 0% of the lesson.

Section 5, Fire-fighting measures (Slide Layer)

Safety Data Sheets (SDS) and Chemical Inventories

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Section 16: Other information

Section 5: Fire-fighting measures - provides recommendations for fighting a fire caused by the chemical.

5. Fire-fighting measures

Suitable Extinguishing Media	Water spray, carbon dioxide (CO2), dry chemical, alcohol-resistant foam. Water mist may be used to cool closed containers.
Unsuitable Extinguishing Media	No information available
Flash Point	90 °C / 194 °F
Method -	No information available
Autoignition Temperature	No information available
Explosion Limits	
Upper	No data available
Lower	No data available
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical
Combustible material. Risk of ignition. Containers may explode when heated. Keep product and empty container away from heat and sources of ignition.

Hazardous Combustion Products
Carbon monoxide (CO). Carbon dioxide (CO_2).
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

Section 6, Accidential release measures (Slide Layer)

Safety Data Sheets (SDS) and Chemical Inventories

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Section 16: Other information

Section 6: Accidental release measures - details the appropriate response to chemical spills, leaks, or releases, including containment, and cleanup to prevent or minimize exposure to people, property, or the environment.

6. Accidental release measures

Personal Precautions	Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Remove all sources of ignition. Take precautionary measures against static discharges.
Environmental Precautions	Should not be released into the environment. Do not flush into surface water or sanitary sewer system. See Section 12 for additional Ecological Information.
Methods for Containment and Clean Up	Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Remove all sources of ignition.

Section 7, Handling and storage (Slide Layer)

Safety Data Sheets (SDS) and Chemical Inventories

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Section 16: Other information

Section 7: Handling and storage - provides guidance on the safe handling practices and conditions for safe storage of chemicals.

7. Handling and storage

Handling	Use only under a chemical fume hood. Do not get in eyes, on skin, or on clothing. Do not breathe mist/vapors/spray. Wear personal protective equipment/face protection. Do not ingest. If swallowed then seek immediate medical assistance. Keep away from open flames, hot surfaces and sources of ignition.
Storage.	Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks and flame.

9 of 25. | You've completed 0% of the lesson.

Section 8, Exposure controls/personal protection (Slide Layer)

Safety Data Sheets (SDS) and Chemical Inventories

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Section 16: Other information

Section 8: Exposure controls/personal protection - list chemical exposure limits, engineering controls, and personal protective measures that can be used to minimize worker exposure.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Formaldehyde	TWA: 0.1 ppm STEL: 0.3 ppm	(Vacated) TWA: 3 ppm (Vacated) STEL: 10 ppm (Vacated) Ceiling: 5 ppm TWA: 0.75 ppm STEL: 2 ppm	IDLH: 20 ppm TWA: 0.016 ppm Ceiling: 0.1 ppm	Ceiling: 0.3 ppm
Methyl alcohol	TWA: 200 ppm STEL: 250 ppm Skin	(Vacated) TWA: 200 ppm (Vacated) TWA: 260 mg/m³ (Vacated) STEL: 250 ppm (Vacated) STEL: 325 mg/m³ Skin TWA: 200 ppm TWA: 260 mg/m³	IDLH: 6000 ppm TWA: 200 ppm TWA: 260 mg/m³ STEL: 250 ppm STEL: 325 mg/m³	TWA: 200 ppm STEL: 250 ppm

9 of 25. | You've completed 0% of the lesson.

Section 9, Physical and chemical properties (Slide Layer)

Safety Data Sheets (SDS) and Chemical Inventories

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Section 16: Other information

Section 9: Physical and chemical properties - identifies physical and chemical properties associated with the product.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Clear
Odor	pungent
Odor Threshold	No information available
pH	7
Melting Point/Range	0 °C / 32 °F
Boiling Point/Range	No information available - 100 °C / - 212 °F
Flash Point	90 °C / 194 °F
Evaporation Rate	> 1.0
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	No information available
Vapor Density	1.0
Specific Gravity	1.10
Solubility	miscible
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	No information available
Viscosity	No information available

9 of 25. | You've completed 0% of the lesson.

Section 10, Stability and reactivity (Slide Layer)

Safety Data Sheets (SDS) and Chemical Inventories

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Section 10: Stability and reactivity - describes the reactivity hazards of the chemical and chemical stability information. This section is broken into three parts: reactivity, chemical stability, and other.

10. Stability and reactivity

Reactive Hazard	None known, based on information available
Stability	Stable under normal conditions.
Conditions to Avoid	Incompatible products. Excess heat. Keep away from open flames, hot surfaces and sources of ignition.
Incompatible Materials	Strong oxidizing agents
Hazardous Decomposition Products	Carbon monoxide (CO), Carbon dioxide (CO_2)
Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

9 of 25. | You've completed 0% of the lesson.

Section 11, Toxicological information (Slide Layer)

Safety Data Sheets (SDS) and Chemical Inventories

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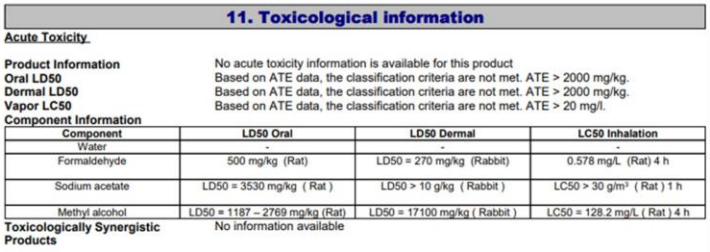
Section 11: Toxicological - identifies toxicological and health effects information, if applicable.



11. Toxicological information

Acute Toxicity

Product Information	No acute toxicity information is available for this product
Oral LD50	Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.
Dermal LD50	Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.
Vapor LC50	Based on ATE data, the classification criteria are not met. ATE > 20 mg/l.

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Water	-	-	-
Formaldehyde	500 mg/kg (Rat)	LD50 = 270 mg/kg (Rabbit)	0.578 mg/L (Rat) 4 h
Sodium acetate	LD50 = 3530 mg/kg (Rat)	LD50 > 10 g/kg (Rabbit)	LC50 > 30 g/m³ (Rat) 1 h
Methyl alcohol	LD50 = 1187 – 2769 mg/kg (Rat)	LD50 = 17100 mg/kg (Rabbit)	LC50 = 128.2 mg/L (Rat) 4 h

Toxicologically Synergistic Products No information available

9 of 25. | You've completed 0% of the lesson.

Section 12, Ecological information (Slide Layer)

Safety Data Sheets (SDS) and Chemical Inventories

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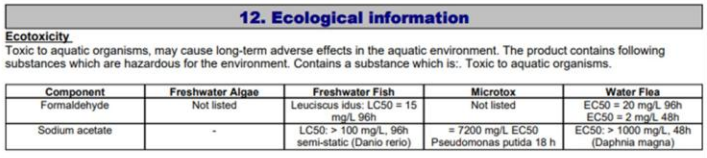
Section 16: Other information

Section 12: Ecological information - This section explains the environmental impact of a chemical(s) if released to the environment.



12. Ecological information

Ecotoxicity

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment. Contains a substance which is:. Toxic to aquatic organisms.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Formaldehyde	Not listed	Leuciscus idus: LC50 = 15 mg/L 96h	Not listed	EC50 = 20 mg/L 96h EC50 = 2 mg/L 48h
Sodium acetate	-	LC50: > 100 mg/L, 96h semi-static (Danio rerio)	= 7200 mg/L EC50 Pseudomonas putida 18 h	EC50: > 1000 mg/L, 48h (Daphnia magna)

9 of 25. | You've completed 0% of the lesson.

Section 13, Disposal considerations (Slide Layer)

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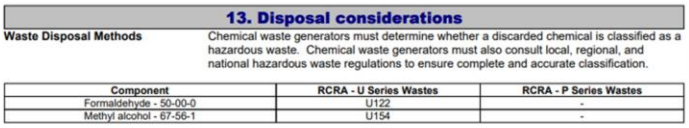
Section 13: Disposal considerations - covers proper disposal, recycling or reclamation of the chemical(s) or its container, and safe handling practices.



13. Disposal considerations

Waste Disposal Methods	Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Component	RCRA - U Series Wastes	RCRA - P Series Wastes
Formaldehyde - 50-00-0	U122	-
Methyl alcohol - 67-56-1	U154	-

9 of 25. | You've completed 0% of the lesson.

Section 14, Transpoprt information (Slide Layer)

Safety Data Sheets (SDS) and Chemical Inventories

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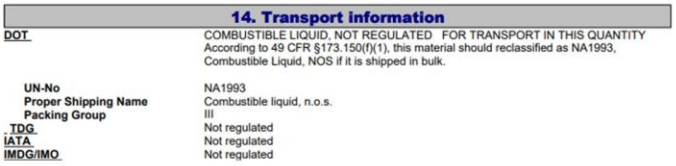
Section 15: Regulatory information
Section 16: Other information

Section 14: Transport information - explains classification information for shipping and transporting of hazardous chemical(s) by road, air, rail, or sea.



14. Transport information

DOT	COMBUSTIBLE LIQUID, NOT REGULATED FOR TRANSPORT IN THIS QUANTITY According to 49 CFR §173.150(f)(1), this material should reclassified as NA1993, Combustible Liquid, NOS if it is shipped in bulk.
UN-No	NA1993
Proper Shipping Name	Combustible liquid, n.o.s.
Packing Group	III
TDG	Not regulated
IATA	Not regulated
IMDG/IMO	Not regulated

9 of 25. | You've completed 0% of the lesson.

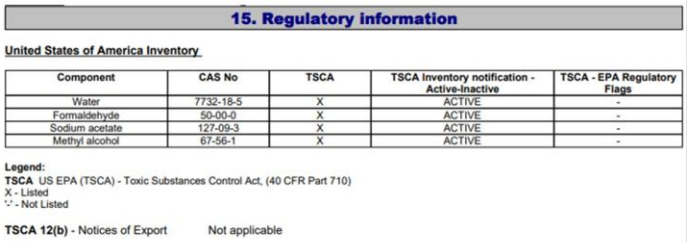
Section 15, Regulatory information (Slide Layer)

Safety Data Sheets (SDS) and Chemical Inventories

Safety Data Sheets, or **SDSs**, are important components of a hazard communication program. Standardized SDS include the sections below.

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

Section 15: Regulatory Information - identifies the safety, health, and environmental regulations specific to the product.



15. Regulatory information

United States of America Inventory

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	TSCA - EPA Regulatory Flags
Water	7732-18-5	X	ACTIVE	-
Formaldehyde	50-00-0	X	ACTIVE	-
Sodium acetate	127-09-3	X	ACTIVE	-
Methyl alcohol	67-56-1	X	ACTIVE	-

Legend:
TSCA US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed

TSCA 12(b) - Notices of Export Not applicable

9 of 25. | You've completed 0% of the lesson.

Section 16, Other information (Slide Layer)

Safety Data Sheets (SDS) and Chemical Inventories

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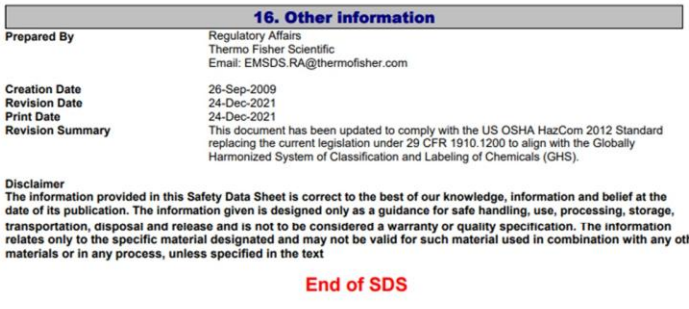
Section 14: Transport information
Section 15: Regulatory information
Section 16: Other information

Section 16: Other Information - tells you when the SDS was originally prepared or the last known revision date. This section of the SDS may also state where changes have been made to the previous version.



16. Other information

Prepared By Regulatory Affairs
Thermo Fisher Scientific
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Creation Date 26-Sep-2009
Revision Date 24-Dec-2021
Print Date 24-Dec-2021
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

9 of 25. | You've completed 0% of the lesson.

2.9 Safety Data Sheets (SDS) and Chemical Inventories

Safety Data Sheets (SDS) and Chemical Inventories

Kaiser Permanente utilizes a web-based safety data sheet and chemical inventory management platform so that this can provide readily available information.

You can access your site-specific chemical inventory and SDSs through your Kaiser Permanente location intranet site or National EH&S SafetyNet.

See **Resources** menu for link to SafetyNet.

Once you've clicked the SafetyNet URL, scroll down the page to find your site specific link.

If you are not sure how to access an SDS or Chemical Inventory, contact your supervisor or your facility EH&S Department.

10 of 25. | You've completed 0% of the lesson.

2.10 Chemical Inventory and SDS Search

Chemical Inventory and SDS Search

Upon accessing the SDS website, there are two ways to search for an SDS.

Click each button.

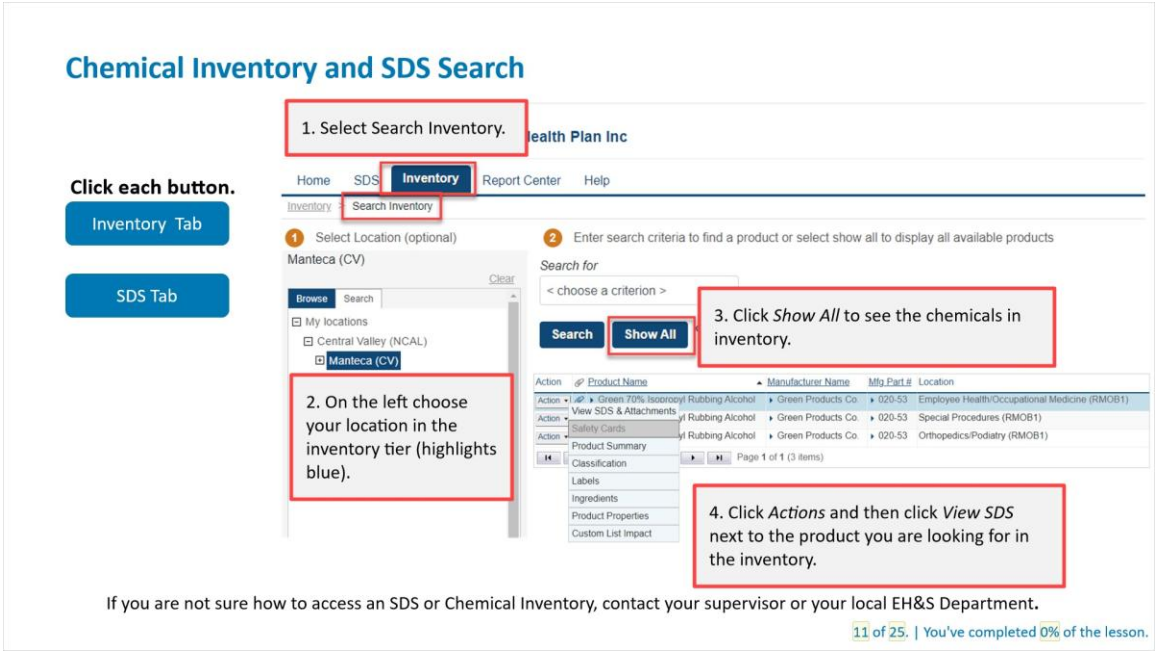
Inventory Tab

SDS Tab

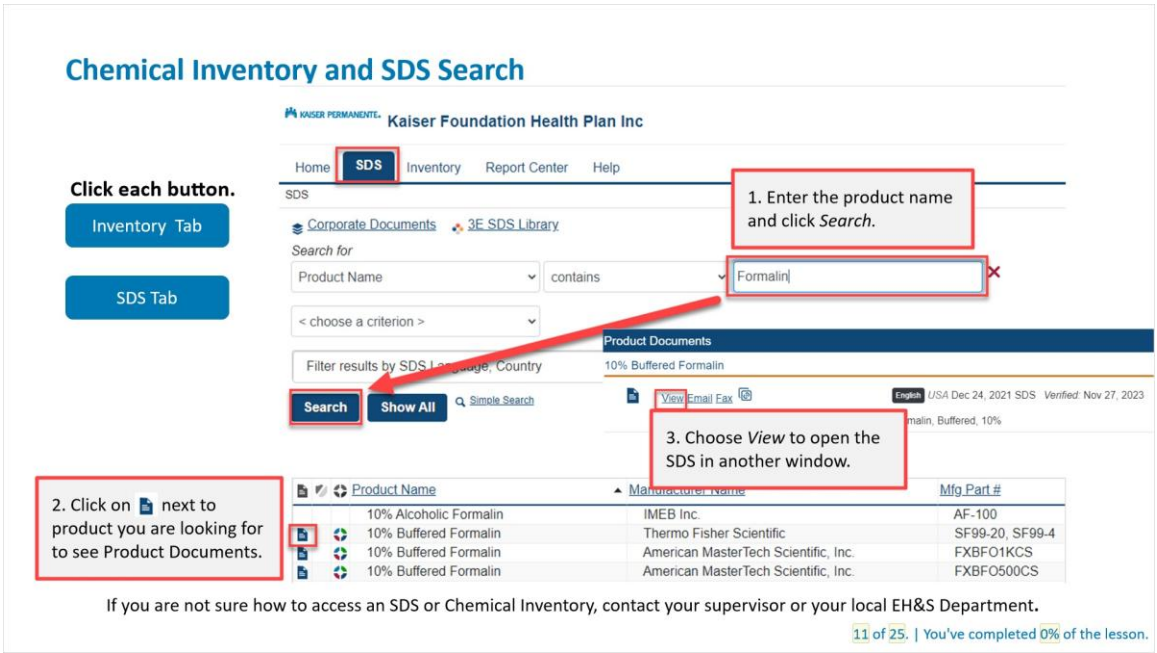
If you are not sure how to access an SDS or Chemical Inventory, contact your supervisor or your local EH&S Department.

11 of 25. | You've completed 0% of the lesson.

Inventory Tab (Slide Layer)



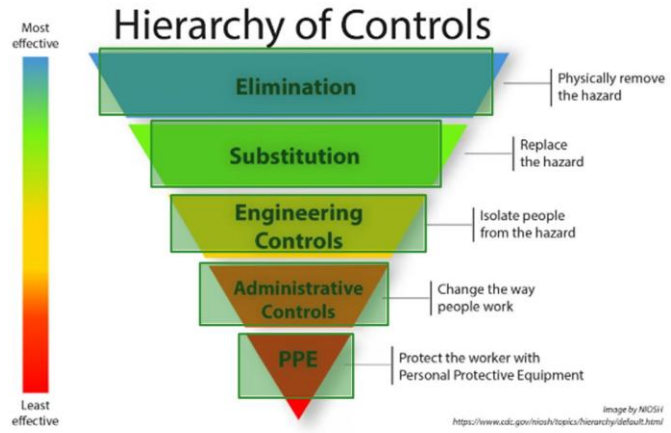
SDS Tab (Slide Layer)



2.11 Hierarchy of Controls

Hierarchy of Controls

Let's look at some ways to protect you from exposure to hazardous chemicals using the hierarchy of controls.
Starting with Elimination click through each level for more information.



12 of 25. | You've completed 0% of the lesson.

PPE (Slide Layer)

Personal Protective Equipment (PPE)

Personal Protective Equipment is **worn to minimize exposure** to chemical hazards by providing a barrier between you and the chemical.

Inspect PPE prior to use.

- Wear appropriate eye protection (goggles or face shield) if there is a potential for a chemical splash to eyes or face.
- Wear appropriate gloves to avoid potential contact with hazardous materials:
  - Nitrile gloves are typically worn for chemical use
  - Cryogenic gloves if handling chemicals like liquid nitrogen
  - Chemotherapy gloves if handling hazardous drugs
- Wear chemical resistant aprons/gowns if there is a potential for a chemical splash to the body.
- When required, wear a respirator to reduce airborne exposure to chemicals. *(NOTE: Typically chemical use at Kaiser Permanente does not require respiratory protection; however, if you are assigned a respirator for chemical use, you will receive additional training on how to use it properly)*

Follow your department's requirements for PPE use.

Close

Administrative (Slide Layer)

Administrative Controls

Administrative controls are work procedures/practices that reduce the duration, frequency, and severity of exposure to hazardous chemicals.

Safe work practices include:

- Know and follow department-specific procedures for chemical use.
- Follow the precautionary statements printed in the SDS and labels.
- Keep containers closed and workspaces clutter-free.
- Store chemicals properly:
  - below eye level
  - with compatible chemicals
  - in storage cabinet when applicable
  - not on the floor
- Clean any spills promptly with the appropriate spill kit.
- Wash your hands after handling chemicals.
- Do not eat, drink, or chew gum near chemicals.

Close

Engineering (Slide Layer)

Engineering Controls

Engineering controls reduce chemical exposure by removing it or enclosing it from the workspace.

Local Exhaust Ventilation (LEV)
LEV example include:

- laboratory fume hoods
- prefabricated grossing stations
- glove boxes
- slot exhaust
- snorkel exhaust

Chemical Management Systems
These systems reduce the need for handling/pouring chemicals. Some examples include auto-feed in SPD scope reprocessors or automated dilution systems (e.g. OxyCide dispenser and metered dose chemical dispensers for flammable liquids.).

If your department uses LEV, it is important that:

- it is inspected at least annually (there is a sticker showing most recent inspection date).
- you know how to properly use it
  - keep chemicals close to exhaust
  - keep exhaust area clutter free
  - keep sash within certified height
- if alarms are sounding, let your manager know so that it can be checked.
- do not perform work within LEV if it is not functioning properly.

Close

Substitution (Slide Layer)

Substitution

Replace chemical with less hazardous alternatives. This includes:

- Using green/environmentally friendly chemicals and cleaners.
- Using a diluted version if clinically feasible (e.g. 10% formalin instead of concentrated 37% formalin).
- Using a less volatile form of the chemical (e.g. paste/topical application instead of a liquid spray/aerosol).
- Replacing a chemical with steam for sterilization.

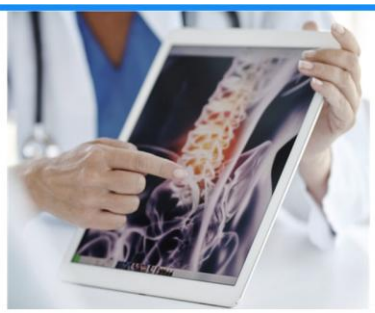
Close

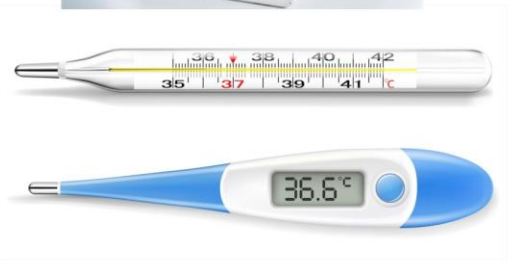
Elimination (Slide Layer)

Elimination

Kaiser Permanente looks for ways to eliminate hazardous chemicals where we can. This may include changing the technology we use to accomplish the task.

For example, x ray chemicals have been replaced by digital technology, and mercury has been removed from thermometers.





Close