

SAUDI BINLADIN GROUP
OPERATION & MAINTENANCE



SBG O&M CHEMICAL CONTROL



SAUDI BINLADIN O&M SAFETY DEPARTMENT

SCOPE

Chemical products commonly used in SBG O&M contain different types of potentially hazardous chemicals, such as acids, alkalis, surfactants, solvents, ammonia compounds and disinfectants. Some of the chemicals are corrosive and can cause chemical burns to the skin and eyes on contact. Other chemicals such as surfactants and solvents may cause skin irritation when used without proper personal protection equipment. Violent chemical reactions may occur with the possibility of generating hazardous reaction products when incompatible chemical substances are mixed. Pest control products, which contain pesticides, may be used in the premises to prevent or kill pests such as rodents and cockroaches. Pesticides are toxic chemicals and are harmful to human. It could be dangerous if contamination of food occurs during the application of pest control products.

Fire and explosion are the major chemical hazards associated with the use of chemicals. Ethyl alcohol and isopropyl alcohol are flammable chemicals and they could be ignited if used near a flame or any other ignition source in particular when used as spraying mist disinfectants. Some of the chemical disinfectants could also pose fire and explosion hazards. Sodium hypochlorite (chlorine bleach) in aqueous solutions is not explosive but anhydrous sodium hypochlorite is potentially explosive. While storage of the chemicals in pantry rooms, the vapors arisen from these chemicals can also be dangerous. Calcium hypochlorite is not flammable but it acts as an oxidizer with combustible materials and enhances burning. Mixing chemical disinfectants with other chemical substances could be hazardous. Rapidly released from sodium hypochlorite solutions (chlorine bleach) is Chlorine, a toxic gas, if mixed with acids, e.g. acidic cleaning agents. Calcium hypochlorite could react violently with ammonia or amines, the ingredients found in cleansing preparations. So, keeping in mind the above concerns it is necessarily required to properly assess the risks related to these type of hazardous chemicals stored in Pantry Rooms, Laundry Stores, Paints Stores and Other chemical storage rooms thus ensuring the safety measures regarding to ensure the safe storage and handling of these chemicals.

PURPOSE

The purpose of the SBG O&M Chemical Control Manual is to provide guidelines and policies that will promote a safe and healthy work environment for all personnel and employees within the company, for all visitors to the organization, and for all other persons who have reason to be working in SBG O&M projects. It is the intent that the policies and guidelines presented in the manual ensure compliance with federal, state and local regulations.

OVERVIEW OF REGULATORY INFORMATION

A large number of regulations affect chemicals handling and control. Most of the chemicals are used by the SBG O&M housekeeping department as regular utilization for the maintenance purposes. While the Final Rule on Occupational Exposure to Hazardous Substances and 1910.120 Hazardous waste operations and emergency response, 29CFR 1910.1450, is the primary OSHA (Occupational Safety and Health Act) regulation concerning work with chemicals, there are also other closely related OSHA regulations directly affecting laboratories. Besides OSHA standards, the Policy regulatory management of SBG O&M is concerned with the hazardous wastes and protection from radiation hazards is regulated by both OSHA and the Civil Defense. In addition, components of the Toxic Substances Control Act apply to all the maintenance projects under SBG O&M. Not more than 60 gallons may be Class I and Class II liquids. No more than 120 gallons of Class III liquids may be stored in a storage cabinet, according to OSHA 29 CFR 1910.106(d)(3) and NFPA 30 Section 4-3.1.



CONTAINMENT

Containment of hazardous materials is required for the protection of the environment from contamination as well as for the protection of SBG O&M employees who work in areas where hazardous materials are stored and used.



DOT 49 CFR 173.3:

(c) Packages of hazardous materials that are damaged or found leaking and hazardous materials that have been spilled or leaked may be placed in a metal removable head salvage drum that is

compatible with the lading and shipped for repackaging or disposal under the following conditions.

(1) The drum utilized may be either a DOT specification or a non-DOT specification drum as long as the drum has equal or greater structural integrity than a package that is authorized for the respective material in this sub-chapter. Maximum capacity shall not exceed 110 gallons.

EPA 40 CFR 264.175:

(a) Container storage areas must have a containment system that is designed and operated in accordance with paragraph (b) of this section.

(b) A containment system must be designed and operated as follows:

(3) The containment system must have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container, whichever is greater. Containers that do not contain free liquids need not be considered in this determination.

OSHA 29 CFR 1910.106 (e)(2)(iii):

Separation and protection. Areas in which flammable or combustible liquids are transferred from one tank or container to another container shall be separated from other operations in the building by adequate distance or by construction having adequate fire resistance. Drainage or other means shall be provided to control spills. Adequate natural or mechanical ventilation shall be provided.

Uniform Fire Code - Division IV, Section 80.402 (b)(2)(F):

Dispensing and Use - Spill Control, Drainage Control, and Secondary Containment. Rooms or areas where hazardous material liquids are dispensed into containers exceeding a 1-gallon capacity or used in open containers or systems exceeding a 5-gallon capacity shall be provided with a means to control spills. Secondary containment shall be provided when the capacity of an individual container exceeds 55 gallons or the aggregate capacity of multiple containers exceeds 100 gallons.

LIQUID HANDLING

The handling of hazardous liquids is subject to both safety and health regulations requiring protection for SBG O&M employees who work with flammable, combustible, and explosive liquids.

Uniform Fire Code - Division IV, Section 80.402 (b)(2)(F):

Safety Can shall mean an approved container, of not more than 5 gallons' capacity, having a spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure.

Safety Can Chemical Compatibility Guide

Table Key

1- Galvanized Steel or Terne Plate

Use when chemical purity is not critical. Some chemicals may adversely affect paint

2 - Polyethylene

Use for storing acids/caustics and other corrosive chemicals.

3- Stainless Steel

Use when chemical purity is critical

Y= Yes N=No

***May discolor solvent if water is present**

CAUTION: Resistance to mixed solvents is unpredictable. Guide DOES NOT apply to mixtures, even if the can is compatible with all components of the mixture.



Reagent	1	2	3
Acetic Acid	N	Y	Y
Acetone	Y*	Y	Y
Aniline	N	Y	Y
Benzene	N	Y	Y
Butadiene	N	N	Y
2-Butanona	Y*	Y	Y
Butylene	N	Y	Y
Chlorofluorocarbons	N	N	Y
Cyclohexane	Y	N	N
Cyclohexanone	N	N	Y
Ethanol	N	Y	Y
Ethyl Acetate	N	Y	Y
Ethyl Ether	Y*	N	Y
Ethylene Glycol	N	Y	Y

Fuel Oil	Y	Y	Y
Gasoline	Y	Y	Y
Heptane	N	Y	Y
Hexane	Y	N	Y
Kerosene	Y	Y	Y
Methanol	N	Y	Y
Methylene Chloride	N	N	Y
Methyl Ethyl Ketone	Y*	N	Y
Methyl Isobutyl Ketone	Y*	Y	Y
Pentane	Y	Y	N
Petroleum Ether	Y	N	Y
Toluene	Y	Y	Y
Trichloroethylene	N	N	N
Xylene	Y	Y	Y

OSHA 29 CFR 1910.106 (e)(2)(ii):

Incidental storage or use of flammable and combustible liquids. Containers. Flammable or combustible liquids shall be stored in tanks or closed containers.

OSHA 29 CFR 1910.106 (a)(9):

Closed container shall mean a container as herein defined, so sealed by means of a lid or other device that neither liquid or vapor will escape from it at ordinary temperatures.

OSHA 29 CFR 1910.106 (e)(2)(iv)(a):

Flammable liquids shall be kept in covered containers when not actually in use.

Uniform Fire Code - Division VIII, Section 79.803 (a) states:

"Class I liquids shall not be run into containers unless the nozzle and containers are electrically interconnected. The provisions of this section shall be deemed to have been complied with where the metallic floor plates on which the container stands while filling are electrically connected to the fill stem or where the fill stem is bonded to the container during filling by means

WASTE MANAGEMENT

Waste management is required to decrease the potential exposure associated with handling hazardous waste. The main hazard is flammability. To help prevent fire, hazardous waste needs special precautions for storage, handling, and use.

OSHA 29 CFR 1910.108 (f)(2):

(2) Waste Cans. When waste or rags are used in connection with dipping operations, approved metal waste cans shall be provided and all impregnated rags or waste deposited therein immediately after use. The contents of waste cans shall be properly disposed of at least once daily at the end of each shift.

OSHA 29 CFR 1910.106 (h)(8)(iii):

Waste and residues. Combustible waste material and residues in a building or operating area shall be kept to a minimum, stored in closed metal waste cans, and disposed of daily.

DOT 49 CFR 173.12:

(b) Outside packaging. The outside packaging must be a DOT specification metal or fiber drum. It may also be a polyethylene drum capable of withstanding:

1. The vibration and compression tests specified in 178.19-7 (c)(1) and (2), and
2. A four foot drop test as specified in 178.224-2 (b).

(c) Inside packaging. The inside packaging must be either glass packaging not exceeding 1-gallon rated capacity, or metal or plastic packaging not exceeding a rated capacity of 5-gallons.

OSHA 29 CFR 1910.106 (e)(2)(ii)(b):

Incidental storage or use of flammable and combustible liquids.

(b) The quantity of liquid that may be located outside of an inside storage room or storage cabinet in a building or in any one fire area of a building shall not exceed:

- (1) 25 gallons of Class IA liquids in containers
- (2) 120 gallons of Class IB, IC, II, or III liquids in containers
- (3) 660 gallons of Class IB, IC, II, or III liquids in a single portable tank.

OSHA 29 CFR 1910.106 (d)(3) (i&ii):

Design, construction, and capacity of storage cabinets -(I)Maximum capacity. Not more than 60 gallons of Class I or Class II liquids, nor more than 120 gallons of Class III liquids may be stored in a storage cabinet.

OSHA 29 CFR 1910.1030:

The blood borne pathogens section applies to all occupational exposure to blood or other potentially infectious materials.

OSHA 29 CFR 1910.1030 (d)(4):

(A)Housekeeping. (i) General. Employers shall ensure that the worksite is maintained in a clean and sanitary condition. (g) Communication of hazards to employees. (1)(i)(A) Warning labels shall be affixed to containers of regulated waste, (B) Labels required by this section shall include the Biohazard symbol. (C) These labels shall be fluorescent orange or orange-red, with lettering and symbols in contrasting color.

SAFETY STORAGE

Improper storage and handling of flammable liquids is the leading cause of industrial fires. Proper storage of flammable liquids can help eliminate millions of dollars of damage and help save the lives of SBG O&M employees.

OSHA 29 CFR 1910.106 (e)(2)(ii)(b):

Incidental storage or use of flammable and combustible liquids. (b) The quantity of liquid that may be located outside of an inside storage room or storage cabinet in a building or in any one fire area of a building shall not exceed:

- (1) 25 gallons of Class IA liquids in containers
- (2) 120 gallons of Class IB, IC, II, or III liquids in containers
- (3) 660 gallons of Class IB, IC, II, or III liquids in a single portable tank.

OSHA 29 CFR 1910.106 (d)(3) (i&ii):

(ii) Fire resistance. Storage cabinets shall be designed and constructed to limit the internal temperature to not more than 325°F when subjected to a 10-minute fire test using the standard time-temperature curve as set forth in Standard Methods of Fire Tests of Building Construction and Materials, NFPA 251-1969. All joints and seams shall remain tight and the door shall remain securely closed during the fire test. Cabinets shall be labeled in conspicuous lettering, **FLAMMABLE-KEEP FIRE AWAY**.

(a) Metal cabinets constructed in the following manner shall be deemed to be in compliance. The bottom, top, door, and sides of cabinet shall be at least No. 18-gauge sheet iron and double walled with 1½-inch air space. Joints shall be riveted, welded, or made tight by some equally effective

means. The door shall be provided with a three-point lock, and a door sill shall be raised at least 2 inches above the bottom of the cabinet.

Uniform Fire Code 79.201:

(g) Storage Cabinets. 1. General. When provisions of this code require that liquid containers be stored in storage cabinets, such cabinets, and storage shall be in accordance with this section. Cabinets shall be conspicuously labeled in red letters on contrasting background FLAMMABLE-KEEP FIRE AWAY.

2. Quantities. The quantity of Class I or Class II liquids shall not exceed 60 gallons and the total quantities of all liquids in a storage cabinet shall not exceed 120 gallons.

3. Construction. Cabinets may be constructed of wood or metal. Cabinets shall be listed or constructed in accordance with the following:

A. Unlisted metal cabinets. Metal cabinets shall be of steel having a thickness of not less than 0.043 inch. The cabinet, including the door, shall be double walled with 1½-inch air space between the walls. Joints shall be riveted or welded and shall be tight fitting. Doors shall be well fitted, self-closing, and equipped with a latching device. The bottom of the cabinet shall be liquid-tight to a height of at least two inches.



CONTAINER LABELING










Three types of chemical containers used in the lab or work areas are subject to container labeling requirements:

1. **Primary or original manufacturer containers** have labels that are prepared by the manufacturer.
2. **Secondary containers** have labels referred to as alternative workplace labels that are prepared by the user of the chemical container. Secondary containers are defined as containers into which chemicals are transferred from the original manufacturer container for use in a lab or work area.
3. **Transfer containers** are used solely to transfer chemicals from a labeled container to a secondary container or for immediate use. Such containers may not require a label when immediately emptied.

The labeling requirements for each of these container types is described below and summarized in this Table. Lab personnel or other users must understand the information conveyed by the manufacture on the primary container labels and how to prepare and understand any alternate workplace container labels.

Pictograms are graphic symbols used to communicate specific information about the hazards of a chemical. OSHA requires chemical hazards to be conveyed via pictograms on primary labels. Each pictogram is determined by the specific OSHA hazard classification(s). See OSHA's nine pictograms and corresponding hazards below



Health Hazard  <ul style="list-style-type: none">• Carcinogen• Mutagenicity• Reproductive Toxicity• Respiratory Sensitizer• Target Organ Toxicity• Aspiration Toxicity	Flame  <ul style="list-style-type: none">• Flammables• Pyrophorics• Self-Heating• Emits Flammable Gas• Self-Reactives• Organic Peroxides	Exclamation Mark  <ul style="list-style-type: none">• Irritant (skin and eye)• Skin Sensitizer• Acute Toxicity (harmful)• Narcotic Effects• Respiratory Tract Irritant• Hazardous to Ozone Layer (Non-Mandatory)
Gas Cylinder  <ul style="list-style-type: none">• Gases Under Pressure	Corrosion  <ul style="list-style-type: none">• Skin Corrosion/ Burns• Eye Damage• Corrosive to Metals	Exploding Bomb  <ul style="list-style-type: none">• Explosives• Self-Reactives• Organic Peroxides
Flame Over Circle  <ul style="list-style-type: none">• Oxidizers	Environment (Non-Mandatory)  <ul style="list-style-type: none">• Aquatic Toxicity	Skull and Crossbones  <ul style="list-style-type: none">• Acute Toxicity (fatal or toxic)

SAFETY DATA SHEETS

Chemical manufacturers and importers must evaluate their products to determine if they are hazardous. If they are considered to be hazardous, a Safety Data Sheet (SDS) must be prepared and sent to end users. It is essential that the end user have access to the information and become familiar with the hazards prior to working with the substance. **Each department or work area must maintain a SDS for each hazardous chemical (or product) they use.**

- Information must be stored in an area that is accessible to all personnel who will be working with the hazardous chemical/product.
- The SDSs may be maintained in paper or electronic form, so long as they are **readily available** to all personnel during the work shift. If SDSs will be stored electronically or on the internet, personnel must have access to a computer with file or internet access. Even if SDSs are stored electronically, hard copies of SDS must be filed if there is not an emergency back-up system for power/equipment failures.
- SDSs must be available upon request in a reasonable time period, generally within 1-2 hours.


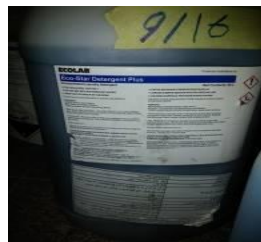
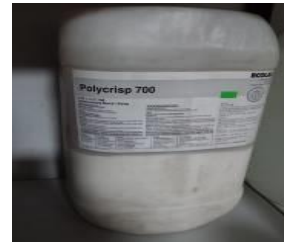
SDSs must contain the following sections:

- Identification (includes product name, manufacturer or distributor and contact information, recommended use and restrictions on use)
- Hazard identification
- Composition/information on ingredients
- First Aid measures
- Firefighting measures
- Accidental release measures
- Handling and storage
- Exposure controls/personal protection
- Physical and chemical properties
- Stability and reactivity
- Toxicological information

CLASSIFICATION:

Chemicals in Laundry Detergents (Highly Toxic)

1. Fragrance
2. Cleaning agents (surfactants)
3. Stabilizers
4. Bleach
5. 1, 4-dioxane
6. Brighteners

1. Fragrance	
Ecolab Micro - Quat Detergent, Germicide, Deodorizer	
2. Cleaning agents (surfactants)	
Ecolab Eco-Star Detergent Plus 30 L	
3. Stabilizers	
Ecolab Polycrisp 700	

4. Bleach

Ecolab Tri star Oxy Brite - Concentrated Liquid Oxygen Bleach



Ecolab Laundry Destainer- Concentrated Chlorinated Bleach
18.9 L



Rust Go A.L Wilson Co. 14 oz. x 4 Bottles



5. 1,4-dioxane

TarGo Dry A.L Wilson Co. 0.946 L



6. Brighteners

Ecolab Eco-Star Sour Control 30 L



TYPICAL HAZARDS

The chemicals found at SBG O&M laundry stores generally contain highly toxic and more volatile components. They have different applications depending upon their use in the various laundry stages. The cleaning agents are included in the formula to help the product clean better. These chemicals are known to release often formaldehyde, a known carcinogen, diethanolamine (linked with skin and eye irritation and possibly liver problems), nonphenolic ethoxylate or NPE (toxic to nerves, irritating to skin, potential hormone disruptor, toxic to aquatic life), linear alkyl benzene sulfonates or LAS (irritating to skin and eyes and toxic to aquatic life; benzene on its own is a carcinogen), and petroleum distillates (linked to cancer and lung damage). Manufacturers combine a number of chemicals to produce a fragrance, some of those chemicals can be very toxic.

The stabilizers are chemicals help stabilize the formula, so that it lasts longer on the shelf. Examples include polyalkylene oxide or ethylene oxide, which are linked with eye and lung irritation, and even dermatitis.

Bleach may be used separately or may be included in the detergent itself. It's known to irritate skin, eyes, and lungs, and when it mixes with wastewater, it can form toxic organic compounds that have been linked with respiratory issues, liver, and kidney damage.

Brighteners are chemicals that actually remain on the clothes to absorb UV light and help clothes "appear" brighter. Just like naphthotriazolystilbenes (linked with developmental and reproductive effects), benzoxazolyl, diaminostilbene disulfonate, and more. Since these remain on the clothes, they are likely to come into contact with skin.

RECOMMENDATIONS:

Each stock chemical container should have a designated storage place, and should be returned to that same location after each use. Storage locations can be marked on containers.

Do not store stock supplies of chemicals on benchtops where they are unprotected from ignition sources and are more easily knocked over. Only chemicals in use or of low hazard levels (e.g., salts and buffers) are permitted on benchtops.

All chemical containers must be closed, including bottles used for waste chemicals. Waste containers must remain sealed except when a worker is actually filling the container with chemical waste. Also Material Safety Data Sheets (MSDS) must be available accordingly for each of the chemical stored inside.

Storage areas should not be exposed to extremes of heat or high temperature conditions. Do not store any chemicals except bleach and compatible cleaning agents under the sink.

It is a poor practice to dilute chemical concentrates by manually tipping drums. Since it is likely to result in a spill risk, it should not be carried out. Proper dispensing device or equipment should be used to prevent spillage during the transfer of chemical concentrates for dilution.

Chemical products should be stored separately from other incompatible chemical products in a cool and well-ventilated area protected from direct exposure to sunlight. For example, chlorine bleach should not be stored together with cleaning products containing ammonia or acidic cleaners.

Waste chemicals such as unused caustic cleaner, acid cleaner and bleach solution should be properly disposed of. The containers holding the chemicals should be thoroughly flushed with water before discarded.



TYPICAL CHEMICALS IN STORE ROOMS (HOUSEKEEPING, PAINTS STORES AND PANTRY ROOMS)

Group 1: Flammables

Group 2: Volatile Poisons

Group 3: Oxidizing Acids

Group 4: Organic and Mineral Acids

Group 5: Liquid Bases



Group 6: Liquid Oxidizers







Group 7: Non-Volatile Poisons






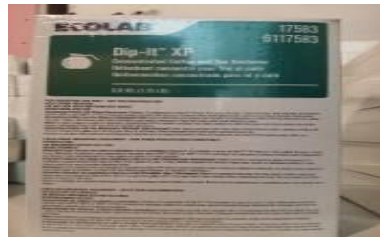
Group 8: Metal Hydrides

Group 9: Dry Solids

Group 1: Flammables




1.	Soldier - Lacquer Thinner	
2.	Hundred - Wood Stain Dark Mahogany- 040 1 L	






3.	Kliaton Paints - Top Coat Gloss Enamel	
4.	Emulsion Stainer - For Tinting water based Paints 9 (By Casati) 110 gm	
5.	Ecolab Radiance	
6.	Ecolab Stainless Steel Cleaner and Polish	
7.	AGM 970 Universal Cleaner For Pipes and Fittings 0.946 L	
8.	WD - 40 Multi Use Product	





9.	Hundred Epoxy Full Gloss	
10.	Elephant Brand - Concentrated Wood Lacquer	
11.	Extra Acrylic Jacor Cryl Lacquer Thinner	
Group 2: Volatile Poisons		
12.	Ecolab Neutral All Purpose Cleaner	
13.	Ecolab Glass Force Professional Strength Glass Cleaner	
14.	Ecolab Dip It XP Concentrated Coffee and Tea Destainer	

15.	Ecolab Solid Brilliance	
16.	Ecolab Oasis 146 Multi Quat Sanitizer	
17.	Ecolab Antibacterial Clean and Smooth	
18.	Ecolab DigiSan Foam Hand Sanitizer	
19.	Ecolab Oasis 13 Orange Force	
20.	Hail Silver Blaze	



21.	Ecolab Mikroklene	
Group 3: Oxidizing Acids		
22.	Meerab - ARM Chemicals Factor	
Group 4: Organic and Mineral Acids		
Group 5: Liquid Bases		
23.	Purovel Awaken Shampoo	
24.	General Purpose Cleaner	
25.	Super Star Dish Washing Liquid 30 L	

26.	Purovel Invigorate Showergel	
27.	Diversey Tapi Extract Carpet Extraction Cleaner	
28.	Purovel Vitalize Conditioner	
29.	Ecolab Solitaire 2.27 kg Concentrated Solid Detergent	
30.	Ecolab Absorbit Heavy Duty Detergent Degreaser and Fryer Cleaner	
31.	Ecolab Lime A Way	

32.	Ecolab Digi Clean Mild Foam Hand Soap	
33.	Ecolab Digi Clean Antibacterial Foam Hand Soap	
Group 6: Liquid Oxidizers		
34.	Master - 999 White Kerosene	
Group 7: Non-Volatile Poisons		
35.	Sanvix - Pipe Joint Lubricant 1kg - Yakoot Island Modern	
36.	Weldon - Plastic Cement - Flow Guard	

37.	Soudal Universal Silicone U	
38.	Boracit - Brazing Powder Made in Pakistan	
39.	Jotun Easy Coat Exterior	
40.	Jotun Durosan O ₂ Exterior Waterborne Paint	
41.	Magic Glue 1 K	
42.	Hardener PB 5	

43.	Orbit Industrial Coating Al Haleef Pain	
44.	Jotun Easy Coat Exterior	
45.	Jotun Fenomastic	
46.	Ecolab Solid Power X	
Group 8: Metal Hydrides		
47.	Ecolab Silver Power	
Group 9: Dry Solids		

48.	Chela Blue Tab 100 tablets Packet	
49.	White Tiger Hi Power Effervescent Chlorine Tablets	



HAZARDS AND RECOMMENDATIONS:

Group 1: Flammable Liquids

Includes liquids with flashpoints < 100°F

Primary Storage Concern: Protect flammable liquids from ignition.

Compatible Storage Groups: Flammables may be with either Group 2: Volatile Poisons, or Group 5: Liquid Bases, but not with both.

Group 2: Volatile Poisons

Includes poisons, toxics, and select and suspected carcinogens with strong odor or an evaporation rate greater than 1

Primary Storage Concern: Prevent volatile poison inhalation exposures.

Compatible Storage Groups: Volatile poisons may be stored with flammables if bases are not present.

Group 3: Oxidizing Acids

All oxidizing acids are highly reactive with most substances and each other.

Primary Storage Concern: Prevent contact and reaction between oxidizing acids and other substances and prevent corrosive action on surfaces.

Acceptable Storage Facilities/Methods: Store in a safety cabinet.

Compatible Storage Groups: Store oxidizing acids on the bottom shelf, below Group 4.

Group 4: Organic and Mineral Acids

Primary Storage Concern: Prevent contact and reaction with bases and oxidizing acids and prevent corrosive action on surfaces.

Acceptable Storage Facilities/Methods: Store in a safety cabinet.

Group 5: Liquid Bases

Liquid bases. Examples include sodium hydroxide, ammonium hydroxide, calcium hydroxide, and glutaraldehyde.

Primary Storage Concern: Prevent contact and reaction with acids.

Acceptable Storage Facilities/Methods: In a safety cabinet; or In tubs or trays in normal cabinet.

Compatible Storage Groups: Liquid bases may be stored with flammables in the flammable cabinet if volatile poisons are not stored there.

Group 6: Liquid Oxidizers

Oxidizing liquids react with everything, potentially causing explosions or corrosion of surfaces.

Primary Storage Concern: Isolate liquid oxidizers from other substances.

Compatible Storage Groups: There are no compatible storage groups for liquid oxidizers; store liquid oxidizers separately from other chemicals.

Group 7: Non-Volatile Liquid Poisons

Includes highly toxic (LD oral rat < 50 mg/kg) and toxic chemicals (LD oral rat < 500 mg/kg), select carcinogens, suspected carcinogens, and mutagens.

Primary Storage Concern: Prevent contact and reaction between non-volatile liquid poisons and other substances.

Acceptable Storage Facilities/Methods: Store in a cabinet or refrigerator (i.e., non-volatile liquid poisons must be enclosed). Do not store on open shelves in the store room. Liquid poisons in containers larger than one liter must be stored below bench level on shelves closest to the floor. Smaller containers of liquid poison can be stored above bench level only if behind sliding (non-swinging) doors.

Compatible Storage Group: Store non-volatile liquid poisons with non-hazardous liquids

Group 8: Metal Hydrides

Most metal hydrides react violently with water, some ignite spontaneously in air (pyrophoric).

Primary Storage Concern: Prevent contact and reaction with liquids and, in some cases, air.

Acceptable Storage Facilities/Methods: Store using secure, waterproof double-containment according to label instructions. Isolate from other storage groups.

Group 9: Dry Solids

Includes all powders, hazardous and non-hazardous. Examples include benzidine, cyanogen bromide, ethylmaleimide, oxalic acid, potassium cyanide, and sodium cyanide.

Primary Storage Concern: Prevent contact and potential reaction with liquids.

Acceptable Storage Facilities/Methods: Cabinets are recommended, but if not available, open shelves are acceptable. Store above liquids. Warning labels on highly toxic powders should be inspected and highlighted or amended to stand out against less toxic substances in this group.

It is recommended that the most hazardous substances in this group be segregated.

A spill of aqueous liquid onto cyanide-containing or sulfide-containing poisons would cause a reaction that would release poisonous gas.

Compatible Storage Groups: Metal hydrides, if properly double-contained, may be stored in the same area as dry solids.



MAJOR COMPONENTS OF CHEMICAL SAFETY PLAN

The major components of SBG O&M chemical safety plan include.

1. Risk Assessment - An evaluation process to assess the likely hazards to SBG O&M employees of the chemical or operations involving chemicals and the severity of such hazard like the pantry rooms, laundry stores, paint stores and other housekeeping stores. The process provides the necessary information for establishing the appropriate safety measures and procedures.

2. Safety Measures - measures established and maintained on the basis of the specific risk assessment to eliminate or reduce the hazards associated with chemicals or operations involving chemicals to ensure the safety and Health of the employees.

3. Emergency Preparedness - quick and effective response in the event of emergencies such as fire, explosion and chemical spill to minimize injuries and damage.

4. Hazard Communication - the means for disseminating to SBG O&Ms employees and workers' safety and health information about the chemicals and processes.

5. Information, Instruction and Training - providing information, instruction and training to help Safety Wardens acquiring the skills, knowledge and attitude to protect their safety and health at work

6. Review - safety measures should be reviewed periodically to monitor their effectiveness particularly when there are new requirements or significant changes in the chemical materials or processes. Safety measures shall be revised, where necessary, taking into account the review findings.