ROYAL CARIBBEAN CRUISES LTD.

Chemical Training – for Crew
CHEM02

Environmental Officer

Objectives - SQM Environmental Chapter 11

SDS Forums and available chemical online training

Know how to read Labels, Super Labels SDS

Chemical storage and transportation procedures

(Chemical color codes)

Proper PPE

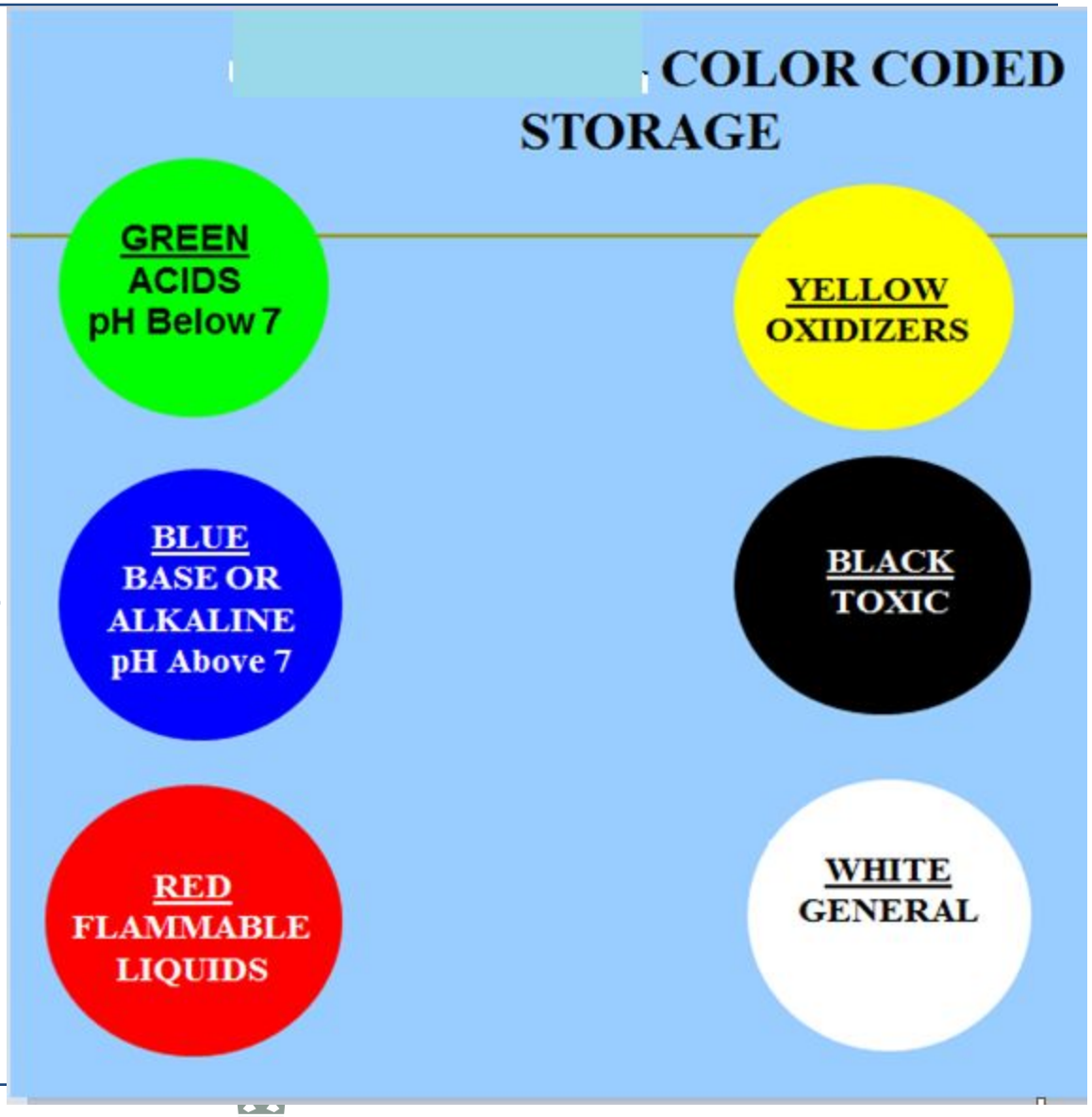
Where you can find “Proper PPE”

The dangers of mixing chemicals

Emergency response procedures in case of a chemical spill

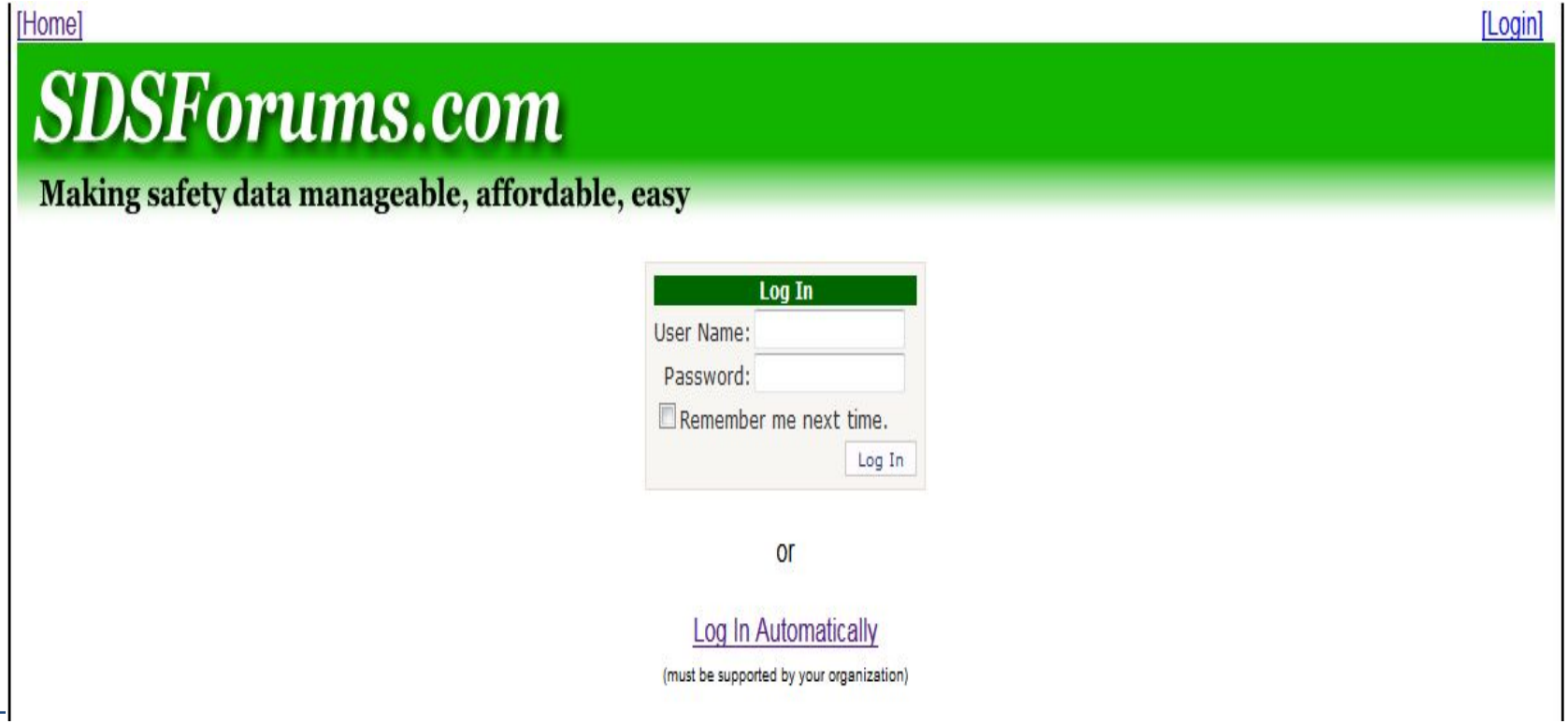
Chemical color code

- All Chemicals assigned color code. Identify the chemical type for safe storage and safe handling as per color code.
- Do not mix chemical with non-compatible type



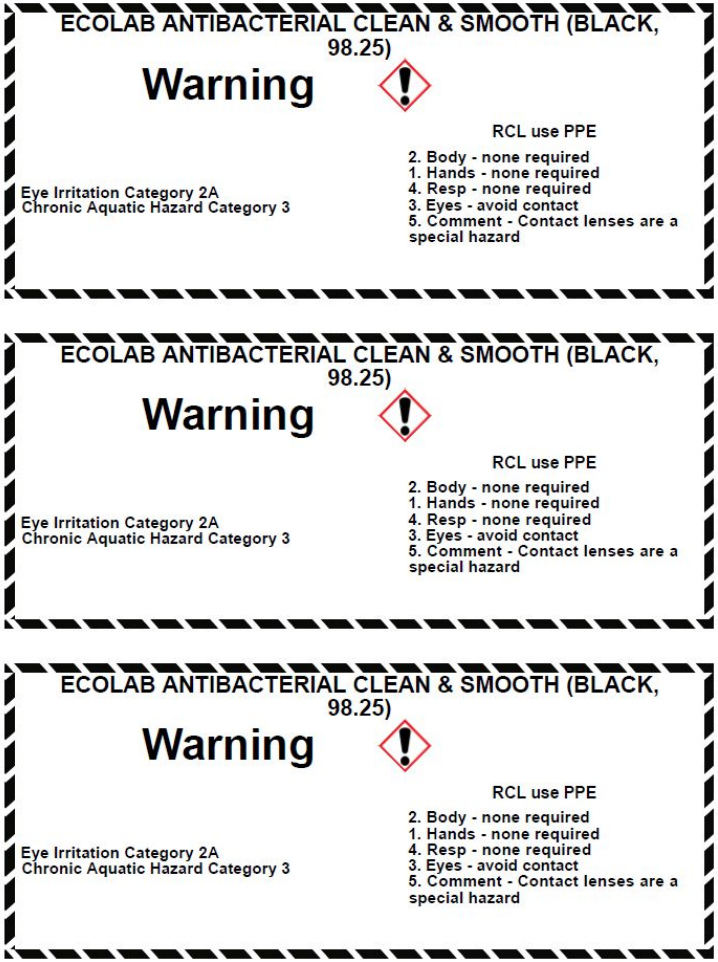
SDS Website – What is SDSForum?

- The SDS website will work on all shipboard computers
- To obtain information about chemicals used onboard
- To print Labels, Super labels, Safety Date Sheet(SDS)
- Do chemical training for more familiarization

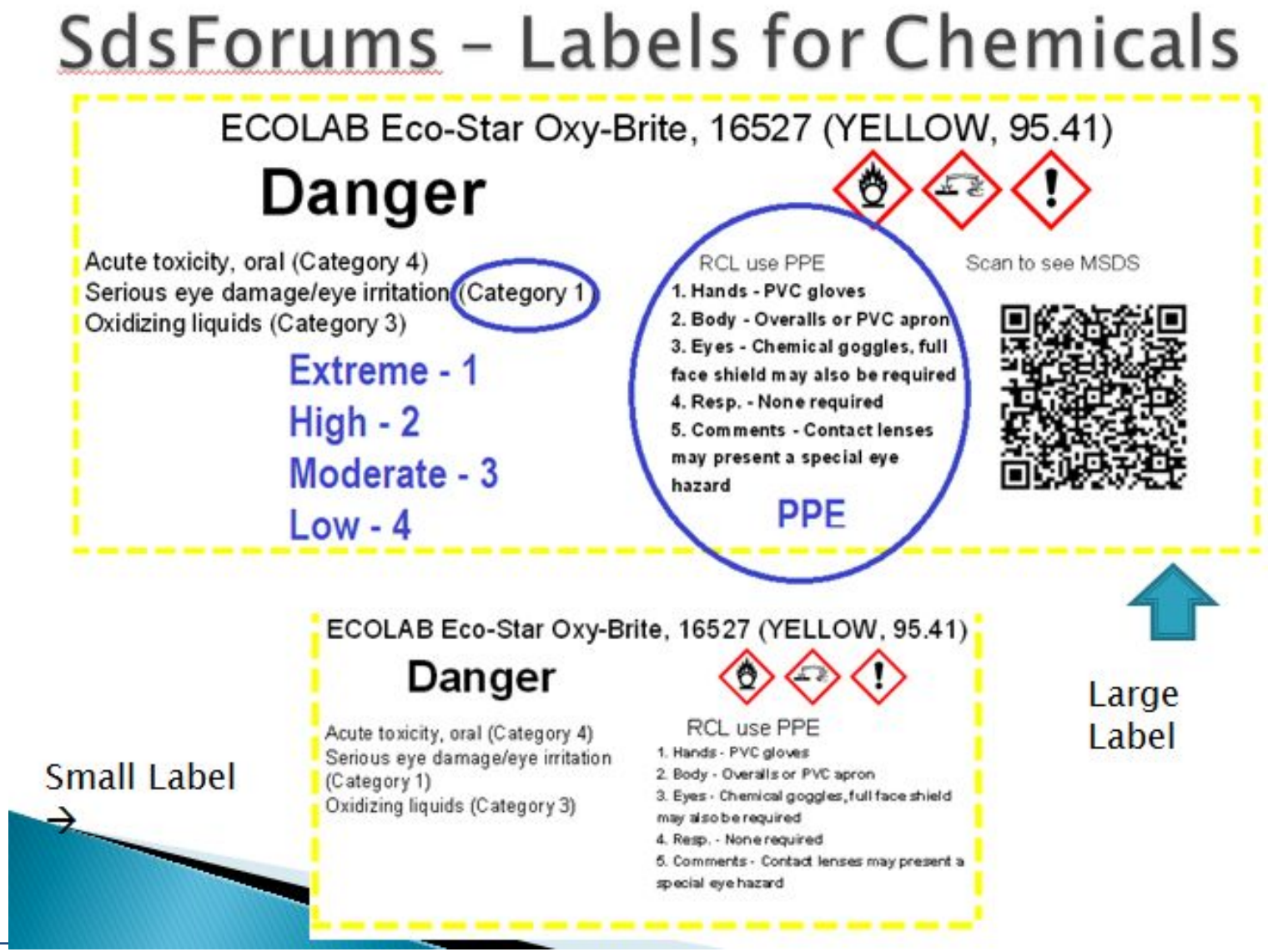


Labels

- Labels are a basic compact explanation of each chemical.
- They give all essential information to include the hazards, PPE requirements and color coded storage instructions.
- This label should be readily available anywhere chemicals are stored and clearly posted where the chemical is stored
- Any person using chemicals should be trained to read and understand the labels .



Labels


SdsForums – Labels for Chemicals
ECOLAB Eco-Star Oxy-Brite, 16527 (YELLOW, 95.41)
Danger
Acute toxicity, oral (Category 4)
Serious eye damage/eye irritation (Category 1)
Oxidizing liquids (Category 3)
Extreme - 1
High - 2
Moderate - 3
Low - 4
RCL use PPE
1. Hands - PVC gloves
2. Body - Overalls or PVC apron
3. Eyes - Chemical goggles, full face shield may also be required
4. Resp. - None required
5. Comments - Contact lenses may present a special eye hazard
PPE
Scan to see MSDS
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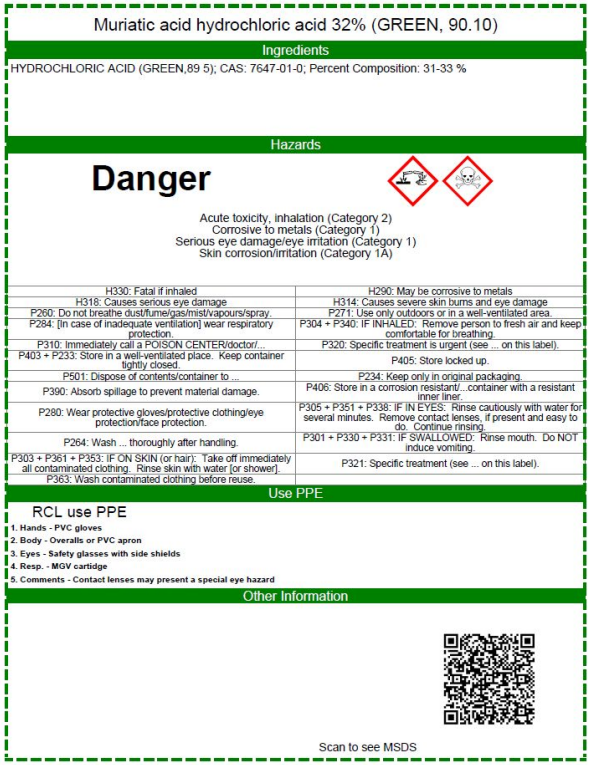
Small Label
Large Label

Super Label

- A Super Label is a 1 page summary of the SDS that has the essentials from the SDS and can give you all information that may be required during an emergency.
- The Super Label should be available inside all main chemical stores
- All supervisors, middle management and above should be able to read and understand how to interpret the Super Label



Muriatic acid hydrochloric acid 32% (GREEN, 90.10)

Ingredients

HYDROCHLORIC ACID (GREEN,89 5); CAS: 7647-01-0; Percent Composition: 31-33 %

Hazards

Danger

Acute toxicity, inhalation (Category 2)
Corrosive to metals (Category 1)
Serious eye damage/eye irritation (Category 1)
Skin corrosion/irritation (Category 1A)

H330: Fatal if inhaled	H290: May be corrosive to metals
H318: Causes serious eye damage	H314: Causes severe skin burns and eye damage
P260: Do not breathe dust/fume/gas/mist/vapours/spray.	P271: Use only outdoors or in a well-ventilated area.
P284: [In case of inadequate ventilation] wear respiratory protection.	P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P310: Immediately call a POISON CENTER/doctor/...	P320: Specific treatment is urgent (see ... on this label).
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.	P405: Store locked up.
P501: Dispose of contents/container to ...	P234: Keep only in original packaging.
P390: Absorb spillage to prevent material damage.	P406: Store in a corrosion resistant/...container with a resistant inner liner.
P280: Wear protective gloves/protective clothing/eye protection/face protection.	P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P264: Wash ... thoroughly after handling.	P301 + P330 + P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].	P321: Specific treatment (see ... on this label).
P363: Wash contaminated clothing before reuse.	

Use PPE

RCL use PPE

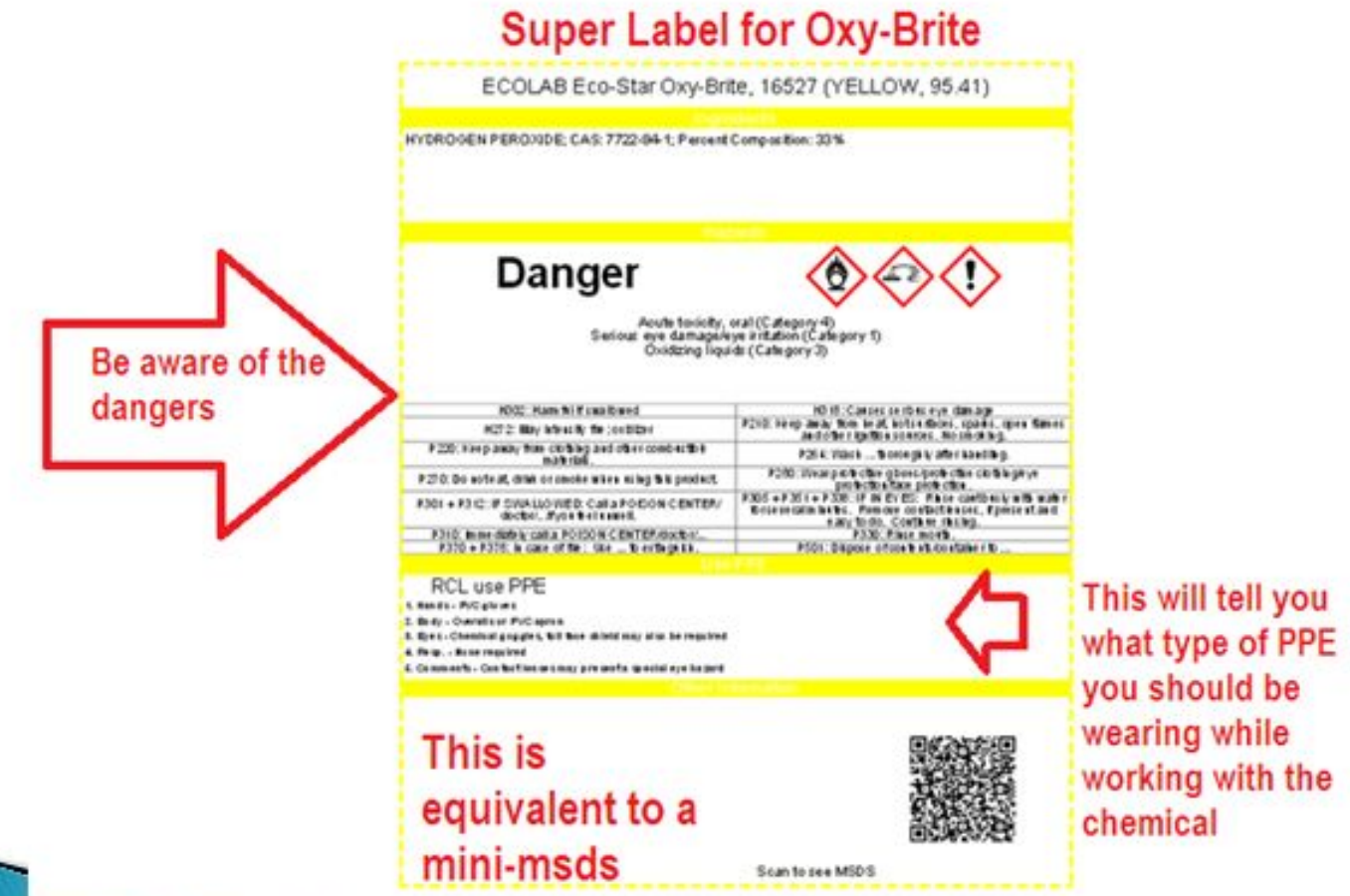
1. Hands - PVC gloves
2. Body - Overalls or PVC apron
3. Eyes - Safety glasses with side shields
4. Resp. - MGV cartidge
5. Comments - Contact lenses may present a special eye hazard

Other Information

Scan to see MSDS

Super Label

SdsForums – SuperLabels



Toxicity - level 1(extreme) to 4(Low)

- **Acute**- if it is so toxic that even a small amount can cause injury or death (example from the ship H2S)
- **Chronic**- Repeated exposure that cause long term issues like cancer. (constant exposure to ammonia can cause asthma and permanent lung damage)
- **Target Organ Effects(TOE) -** chemicals that target specific organs such as the liver or kidneys (the tar in cigarettes that effects the lungs different ship example)
- **Carcinogen**s- suspected to cause cancer (Lead was a suspect for causing cancer when it was used in fuel for cars)
- **Mutagens**- chemicals that causes mutations in organisms (passed along through the offspring – one example is arsenic find example)
- **Teratogens**- Chemicals that cause fetal development defects (alcohol consumed while pregnant causing birth defects)

Proper PPE- Gloves, Apron, Eye protections , respiratory protections

Respiratory protection management guidance

- Care & Use of Respiratory Protection Equipment not followed, e.g.:
  - Respirator cartridges found overdue in excess of 30 days.

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Storage of Chemicals

- Developing good onboard practices will help reduce the risk of injury and accidents
- As you can see from the picture, this ship used solid colored paper to identify the color code of the chemicals being stored there from a distance

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Storage of Chemicals

- Chemicals shall be stored on shelves by color code
- When chemicals of different color coding are stored on the same shelf there must be a leak proof physical barrier separating the 2 chemicals.
- Chemicals must also be secured to reduce the likelihood of a spill or cross contamination

Storage of Chemicals – Chemical Management violation

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Storage of Chemicals - Chemical Management violation

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Storage of Chemicals - Chemical Management violation

Chemical pail without any labels.

All chemical container must be labeled.

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Storage of Chemicals – Danger!

Excessive heat can cause the chemical containers to expand making it unsafe to open

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Storage of Flammable Chemicals

- All Flammable chemicals must be stored in a category 14 space
- Daily use chemicals shall be stored in a flammable cabinet and can not exceed 5 gallons or 20 liters

- Cabinets are available through crunchtime
- Cabinets can be stored in the following space categories 8, 11, 12, and 13

Storage of Flammable Chemicals – SQM violation

FIRE & EXPLOSION

Flammable Lockers Store More Than ''Daily Use'' Quantities

[redacted] Labels Missing

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Storage of Flammable Chemicals – SQM violation

Chemical Management Not Followed

Flammable substances / materials stored in non approved lockers and store rooms (Cat 14 Spaces)

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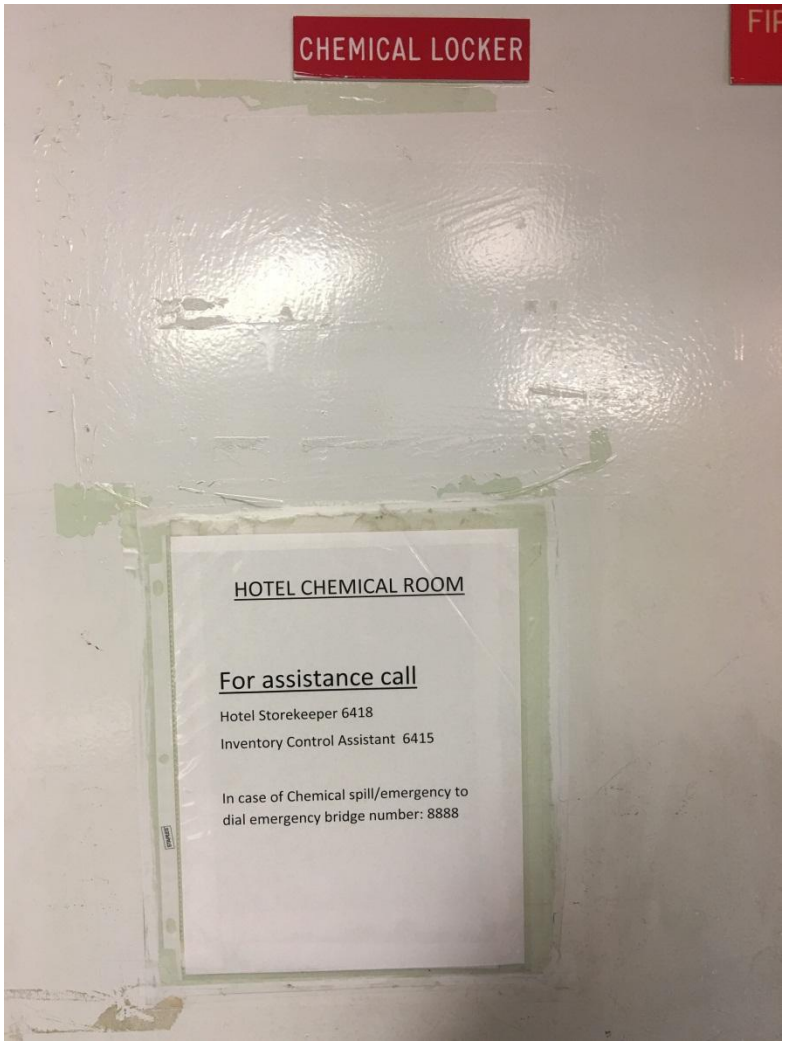
Chemical storages signage

- All Chemical stores shall be clearly marked as such and equipped with a spill kit, eye wash solution and PPE for emergency use.
- Chemical stores and lockers shall have a sign that identifies the responsible person for maintaining the locker and their phone number posted on the door in crew areas and inside the door in guest areas



Audit top findings

FIRE & EXPLOSION

a) Inadequate or non-compliant trash bins found in various venous under the Deck Department / Division supervision.

b) Storage of combustible goods up to the ceiling and blocking sprinkler nozzle heads.

c) Fire doors found blocked.

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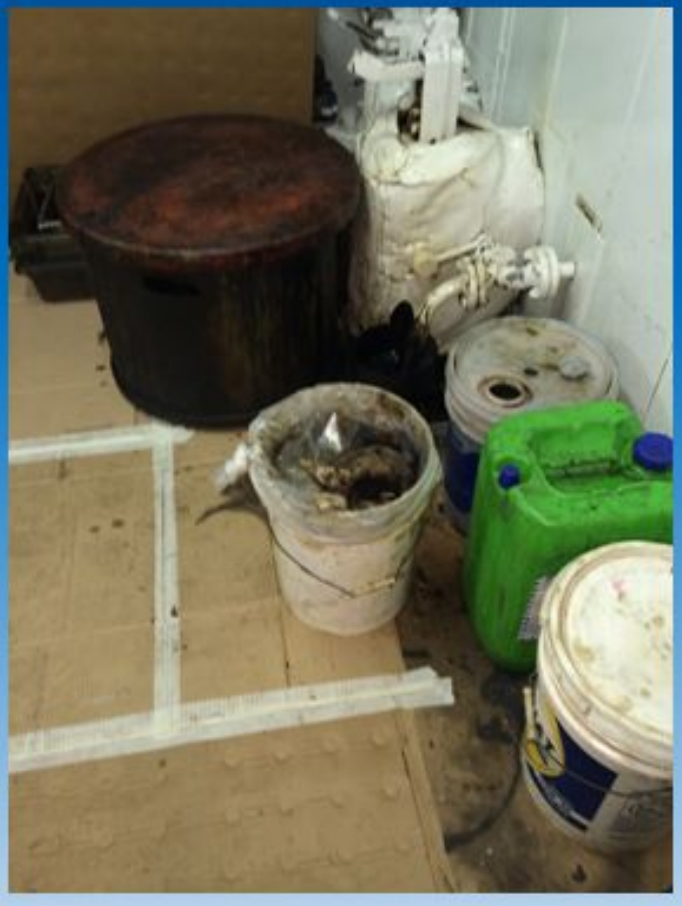
More Audit Top findings

Combustible Trash Bins.

Combustible Trash Bins.



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RCL Chemical Management policy - DO NOT

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Emergency eye wash stations

- Where chemicals are stored and near all dosing stations an eyewash station shall be available within 5 meters
- Eye Wash Bottles are one time use only, do not reuse
- Will only rinse eye for 2 minutes (it is recommended to wash eye for 20 minutes if contact with chemicals)
- Eyewash Replacements for Hotel Department go through

Crunchtime

Eye Protection Note

- If chemicals are to get in your eye, make sure to wash your eyes with water, if no washing station is available there will be eyewash close by to use instead

Spill Response Kits Requirement

- Chemical Spill Response Kits are required inside or immediately outside chemical storage areas if the space is greater than 4 m2 (43 ft2)
- Spill kits are required to be within 5 minutes walking from all other chemical storage areas

Incident Response Policy

- The Hazardous Material Spill response procedures can be found under the Situation Management policy 3.03.3 Oil Spill/Hazardous Material Spill.

- This policy provides a checklist with the proper steps to take in the case of a spill along with additional reporting requirements.

Spill Response Procedures

- What are the steps a crew member should take in the case of a chemical spill.
  - **Secure and evacuate the area, make sure that there is no entry to the area by other crew members**

    If you are outside the area do not enter the area
  - **Call the bridge to report the spill**

    Please provide as much information as you can give (location, type of chemical, size of the spill etc.)
  - **Wait for help to arrive to give a briefing of the situation to the person cleaning up the spill.**