UNDERSTANDING MATERIAL SAFETY DATA SHEETS (MSDS)

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Surface Cleaning Laboratory
THE PURPOSE OF A MSDS

• INFORM THE PUBLIC
  – Material’s physical properties
  – Material’s fast-acting health effects that make it dangerous
  – The level of protective gear/equipment
  – First aid treatment
  – Preplanning and responding to accidents
WHERE TO GET A MSDS

• Manufacturers

• Internet
  – Vermont Safety Information Resources
    • Over 100,000 MSDSs
    • http://hazard.com/msds

• Distributors
WHAT IS ON A MSDS

• MSDS Dictionary

• General Layout
  – Occupational Safety & Health Administration (OSHA)
  – American National Standards Institute (ANSI)

• Example
OSHA MSDS SETUP

- Section I
  - Supplier Information
- Section II
  - Hazard Ingredients / Identity Information
- Section III
  - Physical / Chemical Properties
- Section IV
  - Fire and Explosion Hazard Data
- Section V
  - Reactivity Data
- Section VI
  - Health Hazard Data
- Section VII
  - Precautions For Safe Handling and Use
- Section VIII
  - Control Measures
ANSI MSDS LAYOUT SECTION
I & II

• SECTION I
  – Chemical Product & Company Identification
    • Synonyms
    • CAS No
    • Molecular Weight
    • Chemical Formula
    • Product Codes

• SECTION II
  – Composition/Information on Ingredients
    • Ingredient
    • CAS No
    • Percent
    • Hazardous
ANSI MSDS LAYOUT SECTION

III

- Hazard Identification
  - Emergency Overview
    - Health Rating
    - Flammability Rating
    - Reactivity Rating
    - Contact Rating
    - Lab Protective Equip
    - Storage Color Code

- Potential Health Effects
  - Inhalation
  - Ingestion
  - Skin Contact
  - Eye Contact
  - Chronic Exposure
  - Aggravation of Pre-existing Conditions
• SECTION IV
  – First Aid Measures
    • Inhalation
    • Ingestion
    • Skin Contact
    • Eye Contact

• SECTION V
  – Fire Fighting Measures
    • Fire
    • Explosion
    • Fire Extinguishing Media
    • Special Information
SECTION VI
Accidental Release Measures

SECTION VII
Handling & Storage

SECTION VIII
Exposure Controls/ Personal Protection
   Airborne Exposure Limits
   Ventilation System
   Personal Respirators
   Skin Protection
   Eye Protection
SECTION IX
- Properties
  - Appearance
  - Odor
  - Solubility
  - Specific Gravity
  - pH
  - % Volatiles by volume
  - Boiling Point
  - Melting Point
  - Vapor Density (Air=1)
  - Evaporation Rate (BuAc=1)
- Vapor Pressure

SECTION X
- Stability and Reactivity
  - Stability
  - Hazardous Decomposition Products
  - Hazardous Polymerization
  - Incompatibilities
  - Conditions to Avoid
• SECTION XI
  – Toxicological Information

• SECTION XII
  – Ecological Information
    • Environmental Fate
    • Environmental Toxicity

• SECTION XIII
  – Disposal Considerations

• SECTION XIV
  – Transportation Information
    • Domestic (Land, D.O.T.)
    • International (Water, I.M.O.)
      – Proper Shipping Name
      – Hazard Class
      – UN/NA
      – Information reported for product/size

• SECTION XV
  – Regulatory Information
    • Chemical Inventory Status
    • Federal, State & Int. Regulations
• Other Information
  • NFPA Ratings
  • Label Hazard Warning
  • Label Precautions
  • Label First Aid
  • Product Use
  • Revision Information
  • Disclaimer
  • Prepared by
HAZARDOUS MATERIALS INFORMATION SYSTEM

- HMIS/NFPA
  - Health
  - Fire
  - Reactivity
  - Personal Protection Equipment (PPE)

- 4 = Severe Hazard
- 3 = Serious Hazard
- 2 = Moderate Hazard
- 1 = Slight Hazard
- 0 = Minimal Hazard

PPE = If not listed here, see section 8
WHAT IS MISSING FROM MSDS

• Operating Conditions
  – Equipment
  – Concentrations
  – Temperatures
  – Time
  – Substrate
  – Contaminants

• Technical Data Sheets
OTHER SOURCES

• Merck Chemical Index
  – Listing of chemicals and their properties
  – Helps to fill any missing or misunderstood information

• Toxicological, Occupational, Medical, & Environmental Series (TOMES) Database
CHOOSING AMONG PRODUCT ALTERNATIVES

- Safer Alternatives
- Quick Check
- What to Look For
- In depth Investigating
What are the options
- Non-Ozone Depleting Substance (non-ODS)
- Non-Volatile Organic Compounds (non-VOC)
- Zero Global Warming Potential (GWP = 0)
- Low or No Toxicity
- Non-Flammable
- pH (2.5 ≤ pH ≤ 11)
- HMIS/NFPA (≤ 2)
Specific Environmental Indicators

- Non Petroleum Surfactants
- Non Toxic
- No EDTA
- No NTA
- No Glycol Ethers
- No Phenolics
- No Chlorine bleach

- Biodegradable
- Phosphate Free
- Concentrated
- Works in cold water
- VOC < 10%
- Recyclable Container
- Moderate pH
Non Industrial Cleaning Products
Information Survey

• Manufacturer, Product Name and Use
• Contaminants
• Surfaces
• Methods
• Environmental Indicators
• Additional Information
Specific Information

✓ Contaminants
  ✓ Dirt
  ✓ Dust
  ✓ Grease
  ✓ Grime
  ✓ Fingerprints
  ✓ Food
  ✓ Stains
  ✓ Soap Scum
  ✓ Scuff marks
  ✓ Other

✓ Surface Compatibility
  ✓ Appliances
  ✓ Carpet
  ✓ Counter Top
  ✓ Dishes
  ✓ Glassware
  ✓ Hardwood floor
  ✓ Marble
  ✓ Metal Fixtures
  ✓ Porcelain
  ✓ Tile
  ✓ Windows
  ✓ Other

✓ Method of Cleaning
  ✓ Scrub
  ✓ Soak
  ✓ Spray
  ✓ Wipe
  ✓ Other
Performance Survey for Non Industrial Cleaning Alternatives

- **Method of Cleaning**
  - Wipe, scrub, soak, spray, other
  - Time of Cleaning

- **Contaminants Cleaned Successfully**
  - Dirt, Dust, Grease, Grime, Fingerprint, Food, Stains, Soap, Scum, Scuff marks, Other

- **Surfaces Cleaned**
  - Appliances, Carpet, Counter Tops, Dishes, Glassware, Hardwood Floor, Marble, Metal Fixtures, Porcelain, Tile, Windows, Other

- **Evaluation**
  - Satisfied with overall performance?
  - Any unpleasant odors?
  - Any problems with skin?
  - Any residue?

- **Other Performance Issues?**
# Typical Cleaning Products

## ALL PURPOSE CLEANERS

<table>
<thead>
<tr>
<th>HAZARDOUS CONSTITUENT</th>
<th>POSSIBLE EFFECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AMMONIA</strong></td>
<td>Fumes irritate eyes and lungs; can cause burns or rashes on skin; can produce deadly chloramine gas if mixed with chlorine containing Products</td>
</tr>
<tr>
<td><strong>NFPA Ratings:</strong></td>
<td></td>
</tr>
<tr>
<td>Health:3 Flammability:1 Reactivity:0</td>
<td></td>
</tr>
<tr>
<td><strong>ETHYLENE GLYCOL MONOBUTYL ACETATE</strong></td>
<td>Poisons animals, who are attracted to sweet smell; can cause damage to internal organs through skin absorption; inhalation can cause dizziness</td>
</tr>
<tr>
<td><strong>NFPA Ratings:</strong></td>
<td></td>
</tr>
<tr>
<td>Health:2 Flammability:2 Reactivity:0</td>
<td></td>
</tr>
<tr>
<td><strong>SODIUM HYPERCHLORITE</strong></td>
<td>Corrosive to skin and mucous membranes; fumes irritating</td>
</tr>
<tr>
<td><strong>NFPA Ratings:</strong></td>
<td></td>
</tr>
<tr>
<td>Health:2 Flammability:0 Reactivity:1</td>
<td></td>
</tr>
</tbody>
</table>
**ALL PURPOSE CLEANER**

| Alkyl Polyglycoside surfactant | INCIDENTAL SKIN CONTACT NOT EXPECTED TO CAUSE SIGNIFICANT IRRITATION. CHRONIC SKIN/EYE CONTACT MAY CAUSE MILD IRRITATION. |

**Health:**0  **Flammability:**0  **Reactivity:**0
# Comparison of Products

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Component</th>
<th>Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecolab Oasis 266 All Purpose</td>
<td>Nonylphenol ethoxylate 9016-45-9  Alkyl dimethylbenzyl ammonium chlorides 68424-85-1</td>
<td>SARA 13 Toxic Chemical Toxic Effects Cardiac - Other changes Gastrointestinal- nausea or vomiting Other – Death</td>
</tr>
<tr>
<td>Rochester Midland EnviroCare</td>
<td>Contains no hazardous ingredients as defined in OSHA 29 CFR 1910.1200</td>
<td></td>
</tr>
</tbody>
</table>
1.0 IDENTIFICATION
1.1 Product Name: OASIS 266
1.2 Product Type: All Purpose Cleaner Concentrate
++SARA 13 Toxic Chemical, If present, Are Preceded by “#”
2.0 HAZARDOUS COMPONENTS

<table>
<thead>
<tr>
<th>(mg/m3)</th>
<th>%</th>
<th>PEL</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 #Nonylphenolethoxylate 9016-45-9</td>
<td>10.0</td>
<td>None</td>
<td>UNK</td>
</tr>
<tr>
<td>2.2 A1kyldimethylbenzyl ammonium chlorides</td>
<td>1.0</td>
<td>None</td>
<td>UNK</td>
</tr>
<tr>
<td>68424-85-1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.3 This product contains no other components considered hazardous according to the criteria of 29 CFR 1910.1200

3.0 PHYSICAL DATA
3.1 Appearance: Clear yellow liquid; citrus fragrance.
3.2 Solubility in Water: Complete
3.3 pH: (100%) 7.5-8.5; (1%) 7.0-8.0
3.4 Boiling Point: >212 deg F
3.5 Specific Gravity: 1.020-1.060

4.0 FIRE AND EXPLOSION DATA
4.1 Special Fire Hazards: None.
4.2 Fire Fighting Methods: Product does not support combustion.
5.0 REACTIVITY DATA

5.1 stability: Stable under normal conditions of handling.

5.2 Conditions to Avoid: Do not mix with anything but water.

6.0 SPILL OR LEAK PROCEDURES

6.1 Cleanup: Dike or dam large spills. Pump to containers or soak up on inert absorbent. Flush residue to sanitary sewer.

6.2 Waste Disposal: Consult state and local authorities for restrictions on disposal of chemical waste.

7.0 HEALTH HAZARD DATA

CAUTION

7.1 Effects of Overexposure to Concentrate:

Skin and Eyes: May cause irritation.

If Swallowed: May cause stomach distress, nausea or vomiting.
8.0 FIRST AID
8.1 Eyes: Flush immediately with plenty of cool running water. Contact lenses, if used and then flush again.
8.2 Skin: Flush skin with water, then wash with soap and water.
8.3 If Swallowed: Rinse mouth; then drink 1 or 2 large glasses of water. DO NOT induce vomiting. Never give anything, by mouth to an unconscious person.
IF IRRITATION OR DISCOMFORT PERSISTS, CALL A PHYSICIAN.
9.0 PROTECTIVE EQUIPMENT
9.1 CONCENTRATE: No requirements beyond standard industrial hygiene practices
10.0 ADDITIONAL INFORMATION/PRECAUTIONS
KEEP OUT OF REACH OF CHILDREN

The above information is believed to be correct with, respect to the formula used to manufacture the product. As data, standards and regulations change, and conditions of use and handling are beyond our control, NO WARRANTY, EXPRESS OR IMPLIED, IS MADE A COMPLETENESS OR CONTINUING ACCURACY OF THIS INFORMATION.