

# Are You Ready For **GHS & SDS** Changeover? **What You Need To Know**

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*Brought To You By:*

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&

The AWT  
Young Professionals Group



To be discussed will be the new labeling format (including pictograms), and the new SDS, both of which are required for Global Harmonization. Included in the discussion will be information on how to read SDS, as well as the upcoming compliance dates. Lee will also invite younger members to participate in the Legislative/Regulatory Committee at AWT in 2015 in Nashville and he will be available for questions about SDS/GHS after the presentation.

# GHS

## Globally Harmonized Systems

of Classification and Labeling of Chemicals

**June 1, 2015**

**These changes will have a major  
impact on water treatment.**

GHS requirements will be under OSHA



### *Important Acronyms*

**SDS**

Safety  
Data  
Sheets

**GHS**

Globally Harmonized System  
of Classification and  
Labeling of Chemicals

**HCS**

Hazard  
Communication  
Standard

### **Right to Know**

OSHA's Hazard Communication Standard (HCS), 29 CFR 1910.1200, gives employees working around hazardous chemicals the right to know of possible dangers and how to protect themselves.

# Key Components

**Every chemical supplier will use the same verbiage, pictograms and messages on their labels to convey hazards**

## LABELS

Provide hazard information at the point where the chemical is being used

## SDS

Provide detailed technical information and are a reference source for exposed employees, industrial hygienists, safety and healthcare professionals, emergency responders, and other interested parties

## EMPLOYEE TRAINING

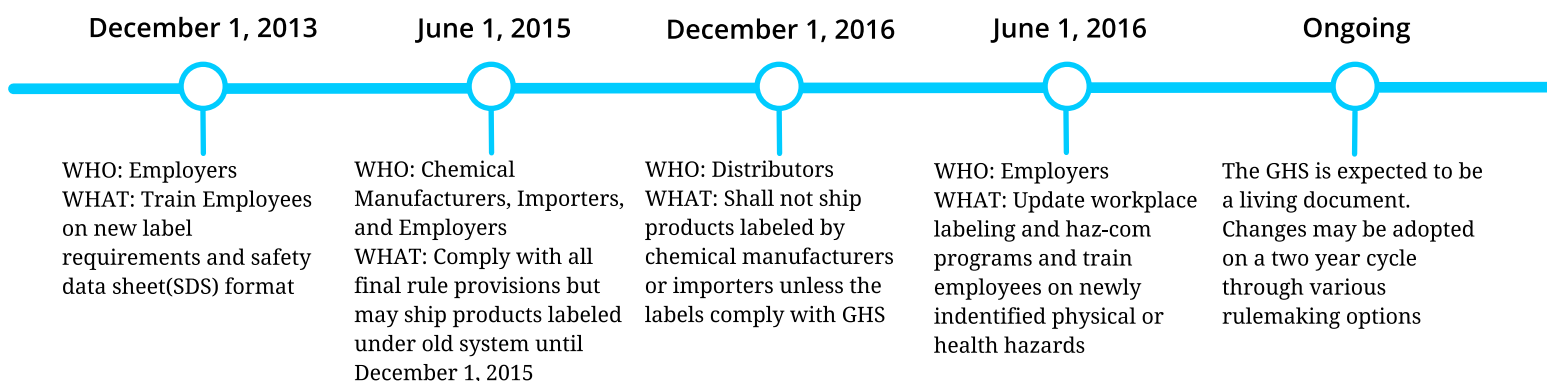
Ensures that employees understand the chemical hazards in their workplace and are aware of protective measures to follow

## Modifications of criteria for classification of chemical hazards

- Revised labeling provisions
- A specified format for safety data sheets
- Revisions to definitions of terms used in the standard
- Requirements for employee training on labels and safety data sheets
- Chemical manufacturers or importers to classify the hazards of chemicals
- Chemical distributors to provide information to employers
- Employers to provide employees with information about hazardous chemicals, labels, safety data sheets (SDSs) and training

**Chemical manufacturers, importers, distributors and employers must be in compliance with all elements of the new rule (except that chemicals with “old” labeling may be shipped until December 1, 2015.)**

## GHS Time Line for Compliance



# Hazard Identification

**Classification is the starting point for hazard communication.**

It involves identifying the hazard(s) of a chemical or mixture by assigning a category of hazard using defined criteria.

**GHS has three broad categories of hazards:**

## Hazard Classification – Health Hazards

- Acute Toxicity
- Skin Corrosion/Irritation
- Serious Eye Damage/Eye Irritation
- Respiratory or Skin Sensitization
- Germ Cell Mutagenicity
- Carcinogenicity
- Reproductive Toxicity
- Target Organ Systemic Toxicity; Single Exposure
- Target Organ System Toxicity; Repeated Exposure
- Aspiration Toxicity

## Hazard Classification – Physical Hazards

- Explosives
- Flammable Gases
- Flammable Aerosols
- Oxidizing Gases
- Oxidizing Solids
- Self-Reactive Substances
- Pyrophoric Liquids
- Pyrophoric Solids
- Self-Heating Substances
- Substances, which on Contact with Water, Emit Flammable Gasses
- Substances Corrosive to Metal
- Gases Under Pressure
- Flammable Liquids
- Flammable Solids
- Oxidizing Liquids

## Hazard Classification – Environmental Hazards

Hazardous to the Aquatic Environment:

- Acute aquatic toxicity
- Chronic aquatic toxicity
  - Bioaccumulation potential
  - Rapid degradability

# Labeling

Labels are intended to provide an immediate visual reminder of chemical hazards.

**As of June 1, 2015, all labels will be required to have:**

The product identifier  
Supplier information  
Pictogram(s), (if applicable)  
A signal word  
Hazard and precautionary statements

Before a product can be labeled, it must be classified into one of 28 types of hazards. Within each of these hazard types are multiple categories related to the degree of danger they present.

## Hazard Categories

|                             |  |
|-----------------------------|--|
| Acute Toxicity - Inhalation | Oxidizing Gases                                    |
| Acute Toxicity - Dermal     | Oxidizing Liquids                                  |
| Acute Toxicity - Oral       | Oxidizing Solids                                   |
| Aspiration Hazard           | Pyrophoric Liquids                                 |
| Carcinogenicity             | Pyrophoric solids                                  |
| Corrosive to Metals         | Self-heating Substances and Mixtures               |
| Explosives                  | Sensitization – Respiratory                        |
| Eye Damage/Irritation       | Sensitization – Skin                               |
| Flammable Aerosols          | Skin Corrosion/Irritation                          |
| Flammable Gases             | Specific Target Organ Toxicity (repeated exposure) |
| Flammable Liquids           | Specific Target Organ Toxicity (single exposure)   |
| Flammable Solids            | Substances and mixtures which, in contact with     |
| Gases Under Pressure        | water, emit flammablegases                         |
| Germ Cell Mutagenicity      | Toxic to Reproduction                              |
| Organic Peroxides           |  |

# Label Elements

## Product Identifier

A product identifier (name) used on a GHS label should match the product identifier used on the SDS.

The product identifier lists the chemical identity of the hazardous substance.

## Pictograms

- Quickly convey specific information
- Make warnings more noticeable and easier for employees to understand.

The specific pictograms that are required on a particular label are determined by the hazard classification. Labels may not have blank (unfilled) squares. **See Next Page**


## Supplier Identification

The name, address and telephone number of the manufacturer or supplier of the product must be provided on the label.

## Precautionary Statements

- Based on the hazard classification of the chemical
- Describe recommended measures that should be taken to protect against hazardous exposures, or improper storage or handling of a chemical
- Includes first aid procedures

**SAMPLE LABEL**

|   |   |
|---|---|
| <b>PRODUCT IDENTIFIER</b><br>CODE _____<br>Product Name _____   | <b>HAZARD PICTOGRAMS</b><br>  |
| <b>SUPPLIER IDENTIFICATION</b><br>Company Name _____<br>Street Address _____<br>City _____ State _____<br>Postal Code _____ Country _____<br>Emergency Phone Number _____   | <b>SIGNAL WORD</b><br><b>Danger</b>   |
| <b>PRECAUTIONARY STATEMENTS</b><br>Keep container tightly closed. Store in cool, well ventilated place that is locked.<br>Keep away from heat/sparks/open flame. No smoking.<br>Only use non-sparking tools.<br>Use explosion-proof electrical equipment.<br>Take precautionary measure against static discharge.<br>Ground and bond container and receiving equipment.<br>Do not breathe vapors.<br>Wear Protective gloves.<br>Do not eat, drink or smoke when using this product.<br>Wash hands thoroughly after handling.<br>Dispose of in accordance with local, regional, national, international regulations as specified.<br><b>In Case of Fire:</b> use dry chemical (BC) or Carbon dioxide (CO <sub>2</sub> ) fire extinguisher to extinguish.<br><b>First Aid</b><br>If exposed call Poison Center.<br>If on skin (on hair): Take off immediately any contaminated clothing. Rinse skin with water. | <b>HAZARD STATEMENT</b><br><b>Highly flammable liquid and vapor.</b><br><b>May cause liver and kidney damage.</b><br><b>SUPPLEMENTAL INFORMATION</b><br><b>Directions for use</b><br>_____<br>_____<br>_____<br>Fill weight: _____ Lot Number _____<br>Gross weight: _____ Fill Date: _____<br>Expiration Date: _____ |

## Signal Word

One of these two signal words must appear on labels:

- DANGER for the more severe hazard categories
- WARNING for less serious hazards

Note:  
if the word "DANGER" appears on the label, the word "WARNING" will not appear.

## Hazard Statements










- Based on the hazard classification of the chemical
- Describe the hazard associated with the chemical
- A statement should be present for each type of hazard
- Multiple, similar statements may be combined.

## Supplementary Information

- Non-harmonized information that is not required or specified under the GHS
- Information that may be required by a competent authority
- Additional information provided at the discretion of the manufacturer GHS provides guidance to ensure that supplemental information does not lead to wide variation in information or contradict or undermine the GHS information.



# Pictograms

|  |  |  |
|--|--|--|
|   |    |   |
| <b>Exploding Bomb</b> <ul style="list-style-type: none"> <li>• Explosives</li> <li>• Self-reactives</li> <li>• Organic Peroxides</li> </ul>  | <b>Corrosion</b> <ul style="list-style-type: none"> <li>• Skin corrosion/burns</li> <li>• Eye damage</li> <li>• Corrosive to metals</li> </ul>   | <b>Flame Over Circle</b> <ul style="list-style-type: none"> <li>• Oxidizing gases</li> <li>• Oxidizing liquids</li> <li>• Oxidizing solids</li> </ul>  |
|    |   |    |
| <b>Gas Cylinder</b> <ul style="list-style-type: none"> <li>• Gases under pressure</li> </ul>   | <b>Environment</b> <ul style="list-style-type: none"> <li>• Aquatic toxicity</li> </ul>  | <b>Skull &amp; Crossbones</b> <ul style="list-style-type: none"> <li>• Acute toxicity (fatal or toxic)</li> </ul>  |
|   |    |   |
| <b>Exclamation Mark</b> <ul style="list-style-type: none"> <li>• Irritant (eye &amp; skin)</li> <li>• Skin sensitizer</li> <li>• Acute toxicity</li> <li>• Narcotic effects</li> <li>• Respiratory tract irritant</li> <li>• Hazardous to ozone layer (non-mandatory)</li> </ul> | <b>Health Hazard</b> <ul style="list-style-type: none"> <li>• Carcinogen</li> <li>• Mutagenicity</li> <li>• Reproductive toxicity</li> <li>• Respiratory sensitizer</li> <li>• Target organ toxicity</li> <li>• Aspiration toxicity</li> </ul> | <b>Flame</b> <ul style="list-style-type: none"> <li>• Flammables</li> <li>• Pyrophorics</li> <li>• Self-heating</li> <li>• Emits flammable gas</li> <li>• Self-reactives</li> <li>• Organic peroxides</li> </ul> |

# Safety Data Sheets

GHS establishes a standardized 16-section SDS format with a prescribed sequence of information and consistent section headings

## **Section 1 – Identification**

- The product identifier used on the label
- Other means of identification
- Manufacturer or distributor name, address, phone number
- Emergency phone number
- Recommended uses of the chemical
- Restrictions on use

## **Section 2 – Hazard(s) identification**

- Hazard classifications
- Signal words, hazard statements, symbols and precautionary statements
- Any hazards not elsewhere classified

## **Section 3 – Composition/Information on ingredients**

- Information on chemical ingredients such as chemical name and synonym
- CAS numbers and other unique identifiers
- For mixtures, chemical names and percentages
- Trade secret claims

## **Section 4 – First-aid measures**

- Includes important symptoms/effects (acute, delayed); required treatment
- Description of necessary measures, subdivided according to the different routes of exposure
- Indication of immediate medical attention and special treatment, if necessary



# Safety Data Sheets

## Section 5 – Firefighting measures

- Lists suitable and unsuitable extinguishing techniques and equipment for chemical hazards from fire
- Specific hazards arising from the chemical, e.g.: nature of any hazardous combustion products
- Special protective equipment and precautions for firefighters

## Section 6 – Accidental release

- Lists emergency procedures, protective equipment and proper methods of containment and cleanup

## Section 7 – Handling and storage measures

- Lists precautions for safe handling and storage, including incompatibilities

## Section 8 – Exposure controls/personal protection

- OSHA's Permissible Exposure Limits (PELs)
- Threshold Limit Values (TLVs)
- Appropriate engineering controls
- Personal protective equipment (PPE)

## Section 9 – Physical and chemical properties

Lists the chemical's characteristics such as:

- |                  |                    |
|------------------|--------------------|
| • Appearance     | • Flash point      |
| • Odor           | • Flammability     |
| • Odor threshold | • Relative density |
| • pH             | • Solubility(ies)  |
| • Freezing point |                    |

# Safety Data Sheets

## Section 10 – Stability and reactivity

- Chemical stability
- Reactivity
- Possibility of hazardous reactions
- Conditions to avoid, e.g.: static discharge, shock or vibration
- Incompatible materials
- Hazardous decomposition products

## Section 11 – Toxicological information

- Likely routes of exposure – inhalation, ingestion, skin and eye contact
- Symptoms related to the physical, chemical and toxicological characteristics
- Delayed and immediate effects
- Chronic effects from short- and long-term exposure
- Numerical measures of toxicity, such as acute toxicity estimates
- If a hazardous chemical is listed in the *National Toxicology Program (NTP)*

*Report on Carcinogens* (latest edition) or has been found to be a potential carcinogen in the *International Agency for Research on Cancer (IARC) Monographs* (latest edition), or by OSHA

## Section 12 – Ecological information

- Ecotoxicity – aquatic and terrestrial, where available
- Persistence and degradability
- Bioaccumulative potential
- Mobility in soil
- Other adverse effects, such as hazardous to the ozone layer

# Safety Data Sheets

## **Section 13 – Disposal considerations**

- Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging

## **Section 14 – Transport information**

- UN number
- UN proper shipping name
- Transport hazard class(es)
- Packing group, if applicable
- Environmental hazards, e.g.: Marine pollutant (yes/no)
- Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
- Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises

## **Section 15 – Regulatory information**

- Safety, health and environmental regulations specific for the product in question

## **Section 16 – Other information**

- The date of preparation or last revision
- Any other information not included elsewhere

**PREPARE TODAY COMPLIANT TOMORROW**

# Example of SDS

## SDS

### Section 1 Identification

Product:

Other Means of Identification: Clear, colorless, basic liquid with a fishy, amine odor similar to ammonia

Recommended Use and Restrictions on Use: Steam line neutralizing amine. Ingredients approved for use in boiler water and steam lines in food processing facilities (21 CFR 173.310) except for use in systems in which steam contacts milk or milk products. Not for use in dairies where steam generated contacts milk or milk products. Not for use in drinking water.

Source:

Emergency Phone: Chemtrec (800) 424-9300

Office Phone:

Website:

### Section 2 Hazard(s) Identification

Emergency Overview: Corrosive. Clear, colorless, basic liquid with an amine (ammonia) odor. Product is corrosive to eyes, skin, and respiratory system. Skin absorption, inhalation, or ingestion may also result in toxic effects. May react with acids. Container head space gases may be flammable if exposed to a source of ignition.

Classification  
29 CFR 1910.1200: Product is hazardous by OSHA criteria.

Signal Word: DANGER  
Hazard Statement(s): Causes severe skin burns and eye damage  
Harmful in contact with skin  
May cause an allergic skin reaction  
Harmful if inhaled  
Causes damage to gastrointestinal system by ingestion  
May cause damage to respiratory system by inhalation (aerosol or mist)  
Suspected of damaging fertility or the unborn child based on oral exposures to rats reported in the literature  
Flammable liquid and vapor

# Example of SDS

Pictogram(s):

Corrosion  
Health Hazard  
Flame  
Exclamation Mark



Precautionary  
Statements:

Do not get in eyes, on skin, or on clothing.  
Wear eye protection and protective industrial rubber gloves. When conditions warrant use, add face shield, apron, and/or rubber boots.  
Do not breathe dusts or mists.  
Wash gloves and contaminated surfaces thoroughly after handling.  
Contaminated work clothing must not be allowed out of the workplace.  
Keep away from sparks and open flame - No Smoking.  
Keep container tightly closed.  
Keep only in original container.  
In case of fire, use whatever extinguishing media is appropriate for surrounding fire.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing for 15 minutes. Immediately, call a doctor.

If on skin (or hair): Immediately, take off all contaminated clothing. Rinse skin with water. Use safety shower if available. Immediately, call a doctor.

If skin irritation or rash occurs: Get medical attention.

Wash contaminated clothing before reuse.

If inhaled: If breathing is difficult, remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a doctor.

If swallowed: Rinse mouth. Do NOT induce vomiting. Immediately, call a poison control center or doctor.

Note to Physicians

No additional information

Keep only in original container.

# Example of SDS

Store in a well ventilated place.  
Store locked up.  
Dispose of contents or container in accordance with local state and federal regulations.

Hazards Not  
Otherwise  
Classified: Headspace gases in open units or residual gases in empty units may represent a fire hazard if exposed to a source of ignition. Product contains 2-6% cyclohexylamine. Cyclohexylamine has a flash point of 79 degrees F. The lower explosive limit (LEL) is 1.6% (V). Product contains 2-20% morpholine. Morpholine has a flash point of 98 degrees F. The lower explosive limit (LEL) is 1.4% (V). Product contains 1-10% diethylaminoethanol (DEAE). DEAE has a flash point of 140 degrees F. The lower explosive limit (LEL) is 6.7% (V).

Ingredients with  
Unknown Toxicity: None

Potential  
Environmental  
Effects: Significant contamination of small bodies of surface water or localized areas at the point of a spill may elevate pH levels above tolerable levels for aquatic organisms.

## Section 3 Composition/Information on Ingredients

|                            | Hazardous Ingredient(s) | CAS#     | % by Wt |
|----------------------------|-------------------------|----------|---------|
| cyclohexylamine            |                         | 108-91-8 | 5-20    |
| morpholine                 |                         | 110-91-8 | 5-20    |
| Diethylaminoethanol (DEAE) |                         | 100-37-8 | 5-20    |

The exact percent by weight of the ingredients in this formulation is proprietary.

## Section 4 First-Aid Measures

Eyes: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing for 15 minutes. Immediately, call a doctor.

Skin: If on skin (or hair): Immediately, take off all contaminated clothing. Rinse skin with water. Use safety shower if available. Immediately, call a doctor.

Inhalation: If inhaled: If breathing is difficult, remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a doctor.

Ingestion: If swallowed: Rinse mouth. Do NOT induce vomiting. Immediately, call a poison control center or doctor.



# Example of SDS

**Acute Symptoms:** Irritation or burns to eyes, skin, or mucous membranes. Injury may result in permanent damage to eyesight or permanent scars on skin. Symptoms of toxic effects following overexposure by skin contact ingestion, or inhalation include CNS abnormalities, drowsiness, dizziness, cough, pulmonary edema, cyanosis of the extremities, diarrhea, nausea, and vomiting.

**Delayed Effects:** Repeated dermal exposure to cyclohexylamine ingredient may result in sensitization.

**Immediate or Special Treatment Requirements:**

After contact with product, immediately flush eyes and/or skin with water for 15 minutes. If safety shower or eye wash is plumbed to cold water, it may be necessary to move victim to a locker room shower or elsewhere to obtain a lukewarm water source before the 15 minute flush is complete. After the 15 minute flush, seek medical treatment.

Product contains organic amines that may permeate skin or mucous membranes. Systemic toxicity by dermal absorption, inhalation, and ingestion is possible. Monitor kidney and liver function and observe for symptoms listed above.

## Section 5 Fire Fighting Measures

**Suitable Extinguishing Media:** Use media appropriate for surrounding fire. Water content in product will reduce product's ability to sustain combustion.

**Specific Hazards:** Product is corrosive to eyes, skin, and respiratory system. Closed containers may rupture (due to buildup of pressure) when exposed to extreme heat. Product contains 5-20% cyclohexylamine. Cyclohexylamine has a flash point of 79 degrees F. The lower explosive limit (LEL) is 1.6% (V). Product contains 5-20% morpholine. Morpholine has a flash point of 98 degrees F. The lower explosive limit (LEL) is 1.4% (V). Product contains 5-20% diethylaminoethanol (DEAE). DEAE has a flash point of 140 degrees F. The lower explosive limit (LEL) is 6.7% (V). Headspace gases in open units or residual gases in empty units may represent a fire hazard if exposed to a source of ignition. If containers rupture or if units are open to the air, headspace gases may be released and accumulate at floor level. Gas may spread across a floor to a source of ignition and flash back.

**Special PPE & Precautions:** Wear self-contained breathing apparatus and full turn-out gear. If possible, move containers away from fire. Cool fire exposed containers with water spray. If containers rupture or leak, product may evolve oxides of nitrogen and oxides of carbon.

# Example of SDS

## Section 6 Accidental Release Measures

|  |   |
|--|---|
| Personal Precautions, PPE, & Emergency Procedures: | Wear chemical splash goggles and protective industrial rubber gloves. When conditions warrant use, add face shield, apron, and/or rubber boots. If spill escapes to sanitary sewer, notify local public works authorities. If spill escapes to the environment, notify state and federal EPA and, if appropriate, the Coast Guard. The CERCLA RQ for cyclohexylamine is 10,000 lbs. |
| Containment & Clean-Up:                            | Eliminate sources of ignition. Contain and collect spills with commercial absorbents. Unused product or spill cleanup residues may be RCRA hazardous waste by the characteristic of corrosivity (D002). Consult local authorities for appropriate waste disposal options in your location.  |

## Section 7 Handling and Storage

|                                |   |
|--------------------------------|---|
| Precautions for Safe Handling: | Open container slowly until pressure is relieved. Avoid spillage. Clean up small spills and drips promptly. Protect product from contamination. Protect product from sources of ignition. Avoid contact between this product and other chemicals, especially acids and oxidizers.   |
| Conditions for Safe Storage:   | Store product in closed container in well ventilated, secure area. Protect containers against physical damage. Protect label. Empty containers retain product residues and all label hazards are still present until container is thoroughly cleaned. Note ingredient flash points and lower explosive limits in stated in Section 2 and repeated in Section 5. Headspace gases in open units or residual gases in empty units may represent a fire hazard if exposed to a source of ignition. . The recommended disposal for rinse waters from empty units is discharge to the treated system. |

## Section 8 Exposure Controls/Personal Protection

Exposure limits for the formulated product are not established. Exposure limits for hazardous ingredients are:

| Ingredient      | Source & Parameter | Exposure Limit |
|-----------------|--------------------|----------------|
| cyclohexylamine | ACGIH TWA TLV      | 10 ppm         |
|                 | OSHA TWA PEL       | none           |

# Example of SDS

|                            |                             |              |
|----------------------------|-----------------------------|--------------|
| morpholine                 | ACGIH TWA TLV <sup>1/</sup> | 20 ppm, skin |
|                            | OSHA TWA PEL                | 20 ppm, skin |
|                            | NIOSH STEL                  | 30 ppm       |
|                            | NIOSH IDLH                  | 1,400 ppm    |
| Diethylaminoethanol (DEAE) | ACGIH TWA TLV               | 10 ppm, skin |
|                            | OSHA TWA PEL                | 10 ppm, skin |
|                            | NIOSH IDLH                  | 100 ppm      |

<sup>1/</sup> The ACGIH and OSHA listings for morpholine and diethylaminoethanol includes a "skin" notation. This underscores the potentially significant contribution of dermal contact and absorption in overexposure incidents. Cyclohexylamine is also a skin permeator.

NOTE: OSHA - Occupational Safety and Health Administration; ACGIH - American Conference of Governmental Industrial Hygienists; NIOSH - National Institute for Occupational Safety and Health; PEL - Permissible Exposure Limit; TWA - Time Weighted Average; TLV - Threshold Limit Value; REL - Recommended Exposure Limit; STEL - Short Term Exposure Limit; IDLH - Immediately Dangerous to Life or Health.

|                            |   |
|----------------------------|---|
| Engineering Controls:      | General exhaust ventilation is adequate. Avoid sources of ignition. Employ work practices and product transfer practices that avoid spills, drips, or contact with incompatible material. |
| Individual Protection/PPE: | Wear chemical splash goggles and protective industrial rubber gloves. When conditions warrant use, add face shield, apron, and/or rubber boots.   |

## Section 9 Physical and Chemical Properties

|   |   |
|---|---|
| Appearance (physical state, color, etc.):     | clear, colorless, basic liquid  |
| Odor:   | fishy amine odor similar to ammonia                                       |
| Odor threshold:                               | not known   |
| pH:   | 11.0  |
| Melting point/freezing point:                 | <32° F  |
| Initial boiling point and boiling range:      | >212° F   |
| Flash point:                                  | 100°F   |
| Evaporation rate:                             | Similar to water  |
| Flammability (solid, gas):                    | Non-flammable   |
| Lower/Upper flammability or explosive limits: | Ingredient LEL/UEL:<br>Cyclohexylamine 1.6%/9.4%<br>Morpholine 1.4%/11.2% |
| Vapor pressure:                               | Not known   |
| Vapor density:                                | Not known, amine ingredients ~3.0   |
| Relative density:                             | Specific gravity, 0.95 - 0.97   |
| Solubility(ies):                              | Completely miscible in water  |
| Partition coefficient: n-octanol/water:       | Not known   |
| Auto-ignition temperature:                    | Not known, amine ingredients - 509-527° F                                 |
| Decomposition temperature:                    | Not known, > 212° F   |

# Example of SDS

Viscosity: Not known

## Section 10 Stability and Reactivity

|                                     |  |
|-------------------------------------|--|
| Reactivity:                         | Product may react with strong acids and strong oxidizers.                              |
| Chemical stability:                 | Stable at ambient temperatures and pressures.  |
| Possibility of Hazardous Reactions: | May react with strong acids and strong oxidizers. . Polymerization will not occur.     |
| Conditions to Avoid:                | Contact with strong acids and strong oxidizers. Avoid exposure to sources of ignition. |
| Incompatible Materials:             | Strong acids and strong oxidizers.   |
| Hazardous Decomposition Products:   | Oxides of nitrogen and oxides of carbon  |

## Section 11 Toxicological Information

Likely Routes of Exposure: Eye or skin contact.

|  |  |
|--|--|
| Symptoms Related to Physical, Chemical, and Toxicological Characteristics: | Product is corrosive to eyes, skin, mucous membranes, and other tissues. Contact will irritate or burn eyes and skin. Permanent damage to eyesight is possible. Permanent scars are possible. Damage (tissue corrosion) to critical respiratory or gastrointestinal systems is possible following overexposure by inhalation or ingestion. Symptoms of toxic effects following overexposure by skin contact ingestion, or inhalation include liver and kidney damage, CNS abnormalities, drowsiness, dizziness, cough, pulmonary edema, cyanosis of the extremities, diarrhea, nausea, and vomiting. |
|--|--|

|                    |  |
|--------------------|--|
| Delayed Effects:   | Dermatitis, pulmonary edema; chemical pneumonitis.                             |
| Immediate Effects: | Irritation or burns to eyes, skin, upper respiratory system, or other tissues. |

|                  |  |
|------------------|--|
| Chronic Effects: | Repeated dermal exposure to cyclohexylamine ingredient may result in sensitization. High dose exposure to cyclohexylamine has produced embryotoxicity, low birth count, post natal mortality, and decreased body weight in laboratory animals. |
|------------------|--|

|                                 |   |
|---------------------------------|---|
| Numerical Measures of Toxicity: | No toxicology available on the formulated product. Toxicology data for product ingredients: |
|---------------------------------|---|

|                     |   |
|---------------------|---|
| m cyclohexylamine   | Oral rat LD50 400 mg/kg (male rat)<br>Dermal rabbit LD50 > 2000 mg/kg, < 5000 mg/kg<br>Inhalation rat LC50 100 mg/l (900 mg/m3), 4 hr |
| morpholine          | Oral rat LD50 1000 mg/kg<br>Dermal rabbit LD50 1000 mg/kg<br>Inhalation mouse LC50 100 mg/l (1,320 mg/m3), 2 hr                       |
| diethylaminoethanol | Oral rat LD50 1000 mg/kg  |

# Example of SDS

|                  |  |                    |
|------------------|--|--------------------|
|                  | Dermal rabbit LD50   | mg/kg              |
|                  | Inhalation mouse LD50  | mg/l (5,000 mg/m3) |
| Carcinogenicity: | None of the product ingredients are listed as carcinogens by IARC, NTP, or OSHA. |                    |

## Section 12 Ecological Information

|                                |   |
|--------------------------------|---|
| Ecotoxicity:                   | No ecotoxicity data available for the formulated product. Significant contamination of small bodies of surface water or localized areas at the point of a spill may elevate pH levels above tolerable levels for aquatic organisms. |
| Persistence and Degradability: | Not known. Amine ingredients are biodegradable.   |
| Bioaccumulative Potential:     | Not known. Bioaccumulation unlikely. Amine ingredients are biodegradable.   |
| Mobility in Soil:              | Not known. Water solubility may enhance mobility in groundwater.  |
| Other Adverse Effects:         | None known.   |

## Section 13 Disposal Considerations

Product is consumed during recommended use. Flush container residues to the treated system. If product is not consumed in use, material is RCRA hazardous waste due to the corrosivity characteristic (D002) and the ignitable characteristic (D001). Dispose of contents or container in accordance with local, state, and federal regulations.

## Section 14 Transport Information

|                            |   |
|----------------------------|---|
| UN Number:                 | 1824  |
| UN Proper Shipping Name:   | Corrosive liquid, n.o.s.  |
| Transport Hazard Class(es) | 8   |
| Packing Group:             | II  |
| Environmental Hazards:     | Does not contain ingredient(s) listed as marine pollutant.  |
| Transport in Bulk:         | Product container meets or exceeds DOT requirements. Material is a Packing Group II corrosive base. No extraordinary measures are required for shipment in bulk tanks including totes. See 49 |

# Example of SDS

Special Precautions: CFR 172.101 & 49 CFR172.102.  
If needed, see Column 7 entries in the DOT hazardous materials table and associated designations at 49 CFR172.102 for detailed descriptions of authorized containers, tank material specifications, maximum degree of filling, minimum pressure tests, and other information.

## Section 15 Regulatory Information

US EPA SARA Title III, EPCRA  
Section 302/303/313 Cyclohexylamine ingredient listed as an EPCRA Extremely hazardous substance, 40 CFR 355 Appendix A

Section 304 Reporting required if cyclohexylamine releases exceed 10,000 lb RQ

Section 311/312 Acute, chronic, fire

US EPA CERCLA If product is designated waste, substance is hazardous per the corrosivity characteristic (D002) and the ignitable characteristic (D001).

US EPA TSCA: All ingredients listed or exempt

## Section 16 Other Information

### NFPA Hazard Ranking

| Health | Fire | Reactivity | Special |
|--------|------|------------|---------|
| 3      | 2    | 0          | Corr    |

### HMIS Hazard Ranking

| Health | Fire | Reactivity | PPE                        |
|--------|------|------------|----------------------------|
| 3      | 2    | 0          | n & p or X (defined below) |

n – splash goggles  
p – gloves  
X – consult supervisor

### References

1. Manufacturers' SDS on file for raw materials used in this product.



# Participation is Important



## The AWT Young Professionals Group & Leg./Reg. Committee



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