Chemical Specific Training

This training program has been developed to provide safety guidelines for commonly used regulated and non-regulated chemicals. It is designed to comply with the Employees Hazardous Chemical Protection and Right-to-Know Rules for chemical specific-training and should be used in conjunction with specified policies and procedures governing your respective University System or Institution. Information in this training program is not intended to replace information contained in individual chemical Material Safety Data Sheets (MSDS).
Contents of this Training Module:

* Understanding MSDS’s and Labels
* Physical Hazards
* Health Hazards
* How to Protect Yourself
Understanding MSDSs

Material Safety Data Sheets (MSDSs) provide pertinent information to employees about hazardous materials and chemicals in the workplace. MSDSs are important sources of chemical information in areas such as:

- Manufacturer information
- Chemical synonyms
- Physical and/or Chemical Health Hazards
- Spill Response
- Personal Protective Equipment (PPE)

The RTK Law requires that MSDSs be readily available in the work areas where potentially hazardous chemicals are used.
Labeling

The manufacturer's label on the container is typically the first information that a user encounters.

Before you get to this point »

You must have an understanding of chemical container labels.
While chemical labels contain good basic information, they are not to be considered a substitute for MSDSs.

Hazardous chemicals are everywhere.

Some of these chemicals pose little danger to you, while others may be deadly.

Mixing of chemicals- know the nature of reaction..

Diluting chemicals- acid to water and NOT water to acid..

KNOW THE RIGHT PROCEDURE
Labeling

Chemical container labels can generally answer a number of questions such as:

- Is this product harmful to my health?
- What specific chemicals are in this product?
- How can I protect myself?
- Who is the manufacturer and how do I contact them?
### Health (Blue)

<table>
<thead>
<tr>
<th>4</th>
<th>Danger</th>
<th>May be fatal on short exposure. Specialized protective equipment required</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Warning</td>
<td>Corrosive or toxic. Avoid skin contact or inhalation</td>
</tr>
<tr>
<td>2</td>
<td>Warning</td>
<td>May be harmful if inhaled or absorbed</td>
</tr>
<tr>
<td>1</td>
<td>Caution</td>
<td>May be irritating</td>
</tr>
<tr>
<td>0</td>
<td>No unusual hazard</td>
<td></td>
</tr>
</tbody>
</table>

### Flammability (Red)

<table>
<thead>
<tr>
<th>4</th>
<th>Danger</th>
<th>Flammable gas or extremely flammable liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Warning</td>
<td>Flammable liquid flash point below 100°F</td>
</tr>
<tr>
<td>2</td>
<td>Caution</td>
<td>Combustible liquid flash point of 100°F to 200°F</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Combustible if heated</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td>Not combustible</td>
</tr>
</tbody>
</table>

### Reactivity (Yellow)

<table>
<thead>
<tr>
<th>4</th>
<th>Danger</th>
<th>Explosive material at room temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Danger</td>
<td>May be explosive if shocked, heated under confinement or mixed with water</td>
</tr>
<tr>
<td>2</td>
<td>Warning</td>
<td>Unstable or may react violently if mixed with water</td>
</tr>
<tr>
<td>1</td>
<td>Caution</td>
<td>May react if heated or mixed with water but not violently</td>
</tr>
<tr>
<td>0</td>
<td>Stable</td>
<td>Not reactive when mixed with water</td>
</tr>
</tbody>
</table>

### Special Notice Key (White)

<table>
<thead>
<tr>
<th>W</th>
<th>Water Reactive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxy</td>
<td>Oxidizing Agent</td>
</tr>
</tbody>
</table>
Physical Hazards

The hazards presented by chemicals may be divided into two general categories:

- Physical (Safety) Hazards
- Health Hazards

LABELS FOR INDICATING PHYSICAL HAZARDS

- Flammables
- Oxidizers
- Explosives
- Compressed gas
Health Hazard

- HEALTH
- POISON
- RADIOACTIVE
- CORROSIVE
- BIOLOGICAL
Health Hazards

Toxicity is the relative degree to which a chemical is harmful. Toxicology is the study of the effects of chemicals in living systems. It is critical that all employees who may work with hazardous chemicals understand the basic principles of toxicology and learn to recognize the major classes of potentially harmful chemicals.
There are four potential routes of entry by which hazardous chemicals enter the body.

1. **Absorption** through the skin via dermal contact.

2. **Ingestion** through the digestive tract. (Ingestion can occur through eating or smoking with contaminated hands or in contaminated work areas).

3. **Inhalation** through the respiratory tract.

4. **Injection** through skin puncture (injuries from "sharps").
Health Hazards

- **ACUTELY TOXIC** chemicals cause adverse health effects after a single short-term exposure eg. Cyanide, nitrogen dioxide

- **CHRONICALLY TOXIC** chemicals cause adverse effects after repeated or longer duration exposure, not immediately apparent eg. Lead or mercury

- **IRRITANTS** cause inflammation of mucous membranes with which they come in contact eg. arsenic compounds, HCl, HF

- **CARCINOGENS** cause cancer in animals or humans eg. Asbestos, benzene, nickel compounds, wood dust

- **ASPHYXIANTS** interfere with supply of oxygen to the vital organs of the body eg. Ethane, nitrogen, methane, acetylene

- **ALLERGENS** cause adverse reaction to the immune system eg. Formaldehyde, isocyantes
PROTECTION

- **Product Substitution** with less or non hazardous materials
- **Engineering Controls** such as chemical fume hoods or enclosures
- **Safe Work Practices** such as proper chemical storage
- **Personal Protective Equipment** such as respirators, aprons, and eye protection
- **Training and Communication** in safe work practices
- **Environmental Monitoring** around chemical handling operations
- **Personal Monitoring** for employees that work with chemicals

Chemical Safety is a Shared Responsibility