# Color Coded Labeling System for Storing Chemicals in your Laboratory

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Color Code</th>
<th>Company</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammables</td>
<td>Red</td>
<td>Fisher, Mallinckrodt, J.T. Baker, etc.</td>
<td>Store in flammable storage cabinet or flammable storage area.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Separate flammable solids from other hazard classes</td>
</tr>
<tr>
<td>Health Hazards / Toxics</td>
<td>Blue</td>
<td>Fisher, Mallinckrodt, J.T. Baker, etc.</td>
<td>When necessary, secure poison area or separate from other chemical storage.</td>
</tr>
<tr>
<td>Reactives / Oxidizers</td>
<td>Yellow</td>
<td>Fisher, Mallinckrodt, J.T. Baker, etc.</td>
<td>Store corrosives in this group in chemical resistant secondary containers of in corrosion proof cabinets.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stored away from organic material and flammables or other incompatible materials.</td>
</tr>
<tr>
<td>Contact Hazard</td>
<td>White</td>
<td>Fisher, Mallinckrodt, J.T. Baker, etc.</td>
<td>Stored in chemical - resistant catch trays or corrosives cabinet.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Store acids away from bases.</td>
</tr>
<tr>
<td>General Storage</td>
<td>Gray Green</td>
<td>Fisher, Mallinckrodt, J.T. Baker, etc.</td>
<td>General Storage can be stored on higher shelves. Store according to the nature of the chemical</td>
</tr>
</tbody>
</table>

**Please Note:**

Chemicals with labels that are colored and striped may react with other chemicals in the same hazard class. See the Material Safety Data Sheet (MSDS) for more information. Chemical containers which are not color coded should have hazard information on the label. Read the label carefully and store accordingly. Look up information on the MSDS whenever necessary.

The alphabetical method of storing chemicals introduces hazards due to chemicals which react violently with each other may be stored in close proximity. A simple color-coded storage system has been devised to address this problem. The code includes both solid and striped colors, which are used to designate specific hazards as follows:

**Red:**
Flammability hazard: Store in a flammable chemical storage area.

**Red Stripe:**
Flammability hazard: Do not store in the same area as other flammable substances.

**Yellow:**
Reactivity hazard: Store separately from other chemicals.

**Yellow Stripe:**
Reactivity hazard: Do not store with other yellow coded chemicals; store separately.
Contact hazard: Store separately in a corrosion-proof location.

Contact hazard: Not compatible with chemicals in solid white category.

Health hazard: Store in a secure poison area.

Not suitably characterized by any of the foregoing categories.

Manufacturer's label their products with an overview of the hazards associated with the product's use. "User" (secondary) containers should be labeled with the chemical name, concentration and an indication of the hazards. Containers used by a single individual during a class period or work shift do not need to be labeled as long as the containers are never stored or left unattended. However, labeling a container is always a good idea because it prevents mix-ups and accidents.

LABELING OF CHEMICAL CONTAINERS

All containers holding chemical or commercial substances with chemical hazards must be labeled appropriately, including those used long term as well as short term storage. Labels will be provided by the department. Labels may be purchased from a vendor, made by the department, or provided by the vendor. The label should be easy to understand and convey the appropriate hazards. The following requirements apply:

1. Containers used by more than one person or that will be stored or left unattended require a label identifying the contents and the hazards associated with its use and storage.
2. Labels on products from the vendor shall not be removed or defaced until the container is empty.
3. Containers to be reused for holding chemicals must have all old labels removed before reusing the container.
4. Very small containers, such as vials, require labeling too, but may be too small to attach a label. In such instances, it is appropriate to store the small containers within a larger container, and then provide an appropriate label out the outside of the larger container.
5. Common names may be used on the label (i.e. Brush Cleaner, Gram Stain, or Nessler Reagent) providing the major components are indicated.
6. Containers that hold a carcinogen or potential carcinogen (>0.1% concentration), must be labeled with a cancer hazard label.
7. The hazard information is available on the label of the original chemical, on the MSDS or chemical catalog.
8. The following information shall be included on all labels:
   - The complete chemical name (no abbreviations). The formula may be added as an option.
   - Concentration & units, if it is not a pure compound.
   - Date of preparation.
o Initials of the preparer.
o Hazard warnings to indicate the health and physical hazards of the chemical.
o Assume that dilutions will have the same hazards as the concentrated material.
o The hazard information can be copied from the label of the original product or MSDS or chemical catalog.

9. Every container shall have a storage color (see Chemical Storage by Hazard Class below).

Examples of Hazard Pictograms that can be used to Convey Chemical Hazards

<table>
<thead>
<tr>
<th>Pictogram</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Diamond with Sections" /></td>
<td>Many container labels will have diamond or a box that is divided into color coded sections: Health (blue), Flammability (Red), Reactivity (Yellow) and Other or Corrosive (white). Numbers of 0-4 will be assigned to each section of the diamond to indicate the degree of hazard; 0 indicates low hazard, and 4 is highest level of hazard.</td>
</tr>
<tr>
<td><img src="image" alt="Skull" /></td>
<td>Toxic or Poisonous</td>
</tr>
<tr>
<td><img src="image" alt="Exclamation Mark" /></td>
<td>Electrical Shock Hazard</td>
</tr>
<tr>
<td><img src="image" alt="Biohazard" /></td>
<td>Biohazardous</td>
</tr>
<tr>
<td><img src="image" alt="Corrosive" /></td>
<td>Corrosive</td>
</tr>
</tbody>
</table>

GHS Hazard Pictograms that are used to Convey Chemical Hazards

<table>
<thead>
<tr>
<th>Pictogram</th>
<th>Description</th>
</tr>
</thead>
</table>
| ![Health](image) | **Health Hazard**
- Carcinogen
- Mutagenicity
- Reproductive Toxicity
- Respiratory Sensitizer
- Target Organ Toxicity
- Aspiration Toxicity |
| ![Flame](image) | **Flame**
- Flammables
- Pyrophorics
- Self-Heating
- Emits Flammable Gas
- Self-Reactives
- Organic Peroxides |
| ![Exclamation](image) | **Exclamation Mark**
- Irritant (skin and eye)
- Skin Sensitizer
- Acute Toxicity
- Narcotic Effects
- Respiratory Tract Irritant
- Hazardous to Ozone Layer (non-Mandatory) |
| ![Gas Cylinder](image) | **Gas Cylinder**
- Gases Under Pressure |
<table>
<thead>
<tr>
<th>Chemical Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Corrosion</strong></td>
<td>Skin Corrosion/Burns, Eye Damage, Corrosive to Metals</td>
</tr>
<tr>
<td><strong>Explosion Bomb</strong></td>
<td>Explosion, Self-Reactives, Organic Peroxides</td>
</tr>
<tr>
<td><strong>Flame Over Circle</strong></td>
<td>Oxidizers</td>
</tr>
<tr>
<td><strong>Environmental – (Non-Mandatory)</strong></td>
<td>Aquatic Toxicity</td>
</tr>
<tr>
<td><strong>Skull and Crossbones</strong></td>
<td>Acute Toxicity (Fatal or Toxic)</td>
</tr>
</tbody>
</table>

**CHEMICAL STORAGE BY HAZARD CLASSIFICATION**

*Storage color codes*

Chemicals are to be stored according to hazard class in all chemical storage areas. The uniform color-code system developed by the J. T. Baker Chemical Company will be amended for use by all departments. Individual modifications of the color code system used within departments should be described in Appendix D of the department Chemical Hygiene Plan.

Many suppliers use a color coding system for chemical storage classification. All of the companies use the color red for flammability, blue for health, and yellow for reactivity as taken from the National Fire Protection Association (NFPA) color code system. Most chemical suppliers use white for contact hazard. Colors for general storage conditions and unusual requirements will vary between manufacturers. A chemical may not always be assigned to the same hazard classes by different suppliers. The J. T. Baker system uses orange to signify general storage. CWU Supervisor will use the color green to indicate general storage conditions.

The goal of any chemical storage classification system is to prevent accidental combination of two or more incompatible materials in the same space. *Chemicals must be separated by space and even physical barriers to prevent an unwanted reaction.* Chemical storage areas should be appropriately labeled.

At a minimum, each department will assign the following color codes to represent the appropriate hazard class of the chemical:

- Red Flammable, flash point of < 100° F. Store away from ignition sources and corrosive and reactive materials.
- Yellow Reactive. Store separately and away from combustible or flammable materials.
• Blue Health Hazard. Poisonous.
• White Contact hazard. Generally corrosive, but may include skin absorption and irritants.
• Green General Storage. Substances with a rating no higher than 2 in any hazard category.

Storage code colors by other companies should be converted to this system. Each chemical should be labeled with a color code to avoid confusion of colors assigned by other manufacturers.

A department may elect to further segregate incompatible materials within the same storage class by using a striped label of the same color. The materials should be segregated within the storage area.

When a color code has not been assigned by a chemical company, a determination must be made based upon the available information. This may include:

1. Using the highest rating issued by the NFPA or hazardous material information (HMIS) system as the primary storage code. (NFPA address acute hazards, such as may occur during storage). Ratings of 2 or less in all categories would be considered general storage (Green)
2. Department of Transportation (DOT) classifications are available for most chemicals, and generally reflect acute hazards associated with transportation.
3. Use available reference materials to derive the most appropriate storage code.
4. All flammable materials (flash point < 100°F) shall be given a red (or red stripe) color code.
5. All oxidizers and reducing agents shall be given a yellow or (yellow stripe) color code.

Examples:
• **Benzene:** Benzene has **NFPA codes** of: Health: 2; Flammability: 3; Instability: 0 therefore this is coded Red.
• **Sodium Chloride:** Sodium chloride has NFPA codes that are all below 2 therefore this is coded Green.
• **Nitric Acid:** The NFPA codes for nitric acid are Health: 4; Flammability: 0; Instability: 0; Special Hazard: OX. By using rule 5 above we see that the oxidizer code overrides the health code therefore this is coded Yellow.
• **Hydrochloric acid:** The NFPA codes for hydrochloric acid are Health 3 and the hazard warning in section 3 indicates this is corrosive. The color for this is White.