College of Dental Medicine
HAZCOMM and Environmental Health & Safety

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Senior Research Safety Team, EH&S
Training Agenda

- Basic Concepts in Safety
- Regulatory Introduction
- Chemical Hazards
- Chemical Safety
- Controlling Hazards
- Emergency Management
Why Training?

- Crucial for a safe work place
- Policy/Procedures may vary
- Required by Occupational Safety & Health Administration (OSHA)
- To understand your rights & responsibilities
- Participate in safety programs and take appropriate action
Roles & Responsibilities

Columbia University

- Identify Hazards
- Provide PPE
- Provide Information
- Provide Training
  - Including task specific training

You

- Ensure your own safety
- Report hazards
- Use PPE
- Follow policies/procedures
- Get Trained
- Promote a safe, healthy & environmentally sound workplace
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Regulatory Information
Columbia University laboratories and dental clinics must comply with rules set by the following regulatory bodies:

- **New York City**
  - Fire Department *(FDNY)*
  - Department of Environmental Protection *(DEP)*

- **New York State**
  - Department of Environmental Conservation *(NYSDEC)*

- **Federal**
  - Department of Labor: Occupational Safety and Health Administration *(OSHA)*
  - United States Environmental Protection Agency *(USEPA)*
OSHA Hazard Communication Standard

- 29 CFR 1910.1200
- You may be exposed to hazardous chemicals in the workplace and have a right to know about the hazards they may pose, and how to protect against exposures.
- The classification of chemical hazards, and the dissemination of safety information to personnel working with chemicals.
Recognizing & Evaluating Hazards

Signs

Labels

Pictograms
GHS: Safety Data Sheets

1. Identification
2. Hazard Identification
3. Composition
4. First Aid Measures
5. Fire-fighting measures
6. Accidental release measures
7. Handling & Storage
8. Exposure Controls
9. Physical & Chemical Properties
10. Stability & Reactivity
11. Toxicological information
12. Ecological information
13. Disposal considerations
14. Transport information
15. Regulatory information
16. Other information

New SDS! Check it Out
**Chemical Example: Methyl methacrylate**

**GHS SAFETY DATA SHEET**

**WELD-ON® SS1515™ 2-Component Methacrylate Adhesive (1:1 Mix Ratio)**

**SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION**

**PRODUCT NAME:** WELD-ON® SS1515™ 2-Component Methacrylate Adhesive (1:1 Mix Ratio)

**PRODUCT USE:** 2-Component Adhesive for bonding thermoplastics, metals and other composites

**SUPPLIER:** IPS Corporation

**MANUFACTURER:** IPS Corporation
600 Ellis Road, Durham, NC 27703 - USA
P.O. Box 12729, Research Triangle Park, NC 27709 - USA
Tel. 1-919-598-2400

**EMERGENCY:** Transportation: Tel. 800.424.9300, 703.527.3887 CHEMTREC (International)

**Date Revised:** DEC 2009

**Supersedes:** APR 2007

**SECTION 2 - HAZARDS IDENTIFICATION**

**GHS CLASSIFICATION**

<table>
<thead>
<tr>
<th>Health</th>
<th>Acute Toxicity: Category 4</th>
<th>Skin Irritation: Category 2</th>
<th>Skin Sensitization: YES</th>
<th>Eye: Category 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental</td>
<td>Acute Toxicity: Category III</td>
<td>Chronic Toxicity: Category IV</td>
<td>Physical</td>
<td>Flammable Liquid: Category 2</td>
</tr>
</tbody>
</table>

**GHS LABEL:**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tbody>
</table>

**WHMIS CLASSIFICATION:** CLASS B, DIVISION 2
CONTROLLED PRODUCT CLASS D, DIVISION 2B

**Hazard Statements**

- Highly flammable liquid and vapor
- May cause irritation/allergic skin reaction
- Do not breathe vapor

**Precautionary Statements**

- Keep container closed
- Use in well-ventilated area

**SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS#</th>
<th>EINECS #</th>
<th>REACH Pre-registration Number</th>
<th>Concentration % by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component &quot;A&quot; (SS1500-A Adhesive) Methyl Methacrylate Monomer (MMA),* Stabilized</td>
<td>80-62-6</td>
<td>201-297-1</td>
<td>05-2116297731-37-0000</td>
<td>45 - 65</td>
</tr>
<tr>
<td>Methacrylic Acid (MAA)</td>
<td>79-41-4</td>
<td>201-204-4</td>
<td>05-2116297727-26-0000</td>
<td>&lt; 8</td>
</tr>
<tr>
<td>Tetramethyl-5-decylene-4,7-diol, 2,4,7,9-</td>
<td>126-86-3</td>
<td>204-809-1</td>
<td>Under development</td>
<td>&lt; 5</td>
</tr>
<tr>
<td>Trifunctional Acid Ester</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Component &quot;B&quot; (SS1515-B Activator) Methyl Methacrylate Monomer (MMA),* Stabilized</td>
<td>62-62-9</td>
<td>201-207-1</td>
<td>05-2116297701-67-0000</td>
<td>65 - 70</td>
</tr>
</tbody>
</table>

* Stabilized
Using ChemWatch

- Columbia’s online source for safety data sheets.
- Available from any computer on the CU network.

http://jr.chemwatch.net/chemffx/
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Chemical Hazards
Chemical Hazards: Routes of Exposure

How might you be exposed to a chemical hazard?

- **Inhalation**
  - Be aware of aerosol-producing procedures such as accidental spills, removing caps/ tops, & clean-up can put you at increased risk of exposure.

- **Absorption**
  - The skin is the largest organ in the human body and offers an important protective cover. Your skin is the major route of entry for hazardous substances in the workplace.

- **Ingestion**
  - A common route of chemical exposure is INGESTION due to contaminated food or hands. **NO EATING OR DRINKING IN THE LAB AND CLINIC!**
Chemical Hazards: Routes of Exposure

- **Injection**

  Sharps, including needles, razor blades, and glass can cause cuts, lacerations, and punctures.

  All needles, syringes and blades must be discarded in rigid sharps containers regardless of the status of biological contamination.

  Limit use, do not recap needles
  Do not remove needles from syringes
  Do not bend, break, or manipulate syringes
Chemical Exposure: Health Effects

- **Acute effects** – Sudden, traumatic effects
  - Headaches, dizziness, burns from corrosive chemicals, rash

- **Chronic effects** – Slow, gradual effects not readily perceivable until long after the initial exposure
  - Cancer, mutation, reproductive effects

Not all chemical exposures will show immediate effects!
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Controlling Hazards
Hierarchy of Controls

1. Elimination
2. Substitution
3. Engineering
4. Administrative
5. Personal Protective Equipment (PPE)
Controlling Hazards

- Mercury Dental Filling vs Resin Composite

Elimination

Mercury Dental Filling
Resin Composite

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Controlling Hazards

Engineering Controls

- HVAC System
- Fume Hoods
- Machine Guards

Elimination

Substitution

Engineering

Administrative

Protective Equipment
Administrative Controls

- Policies, procedures, effective communication and best work practices designed to ensure the safety of personnel.
- Consult an experienced staff or faculty member before modifying a protocol, or procedure.
Controlling Hazards

Administrative Controls

- Proper storage and segregation of hazardous materials.
- Proper chemical container labeling

Open Containers

No Labels

???
Administrative Controls: Compressed Gases

You must label, store, and use cylinders of gases, such as oxygen, nitrous oxide, and propane according to published standards.

- Always in the upright position
- All compressed gases restrained
  - Chained to a wall
  - Or using a Cart
- Must be capped if not in use
- Do not hang items on them
Controlling Hazards

Administrative Controls: Housekeeping
Controlling Hazards

MUST BE WORN AT ALL TIMES IN THE LAB:

- Proper Work Attire
- Scrubs
- Lab coats/Aprons
- Safety glasses / goggles
- Protective gloves
Controlling Hazards: Proper Work Attire

When working in the lab & clinic you must wear PPE & proper attire or you will be asked to leave the immediately.
Controlling Hazards: PPE

Columbia University PPE Policy

Columbia University’s Personal Protective Equipment Policy addresses the use of PPE in all University laboratories & support areas. The Policy is designed to ensure that the University’s research & teaching community understand proper PPE selection, PPE use and maintenance, and meet established safety standards.

Please visit the PPE website for details & guidance on the policy!

http://www.ehs.columbia.edu/ppe.html
Controlling Hazards: PPE Webpage

Columbia University’s Personal Protective Equipment (PPE) Policy addresses the use of PPE in all University laboratories and support areas. The Policy is designed to ensure that the University’s research and teaching community understand proper PPE selection, PPE use and maintenance, and meet established safety standards.

The appropriate use of PPE is critical in reducing exposure to laboratory hazards and represents the last line of defense against potential exposure. PPE is provided at no cost to affected personnel and used whenever the potential for occupational exposure exists. In most instances, the minimum level of PPE for laboratory personnel consists of a lab coat, gloves, and eye protection.

Please visit the links below for detailed information regarding PPE:

- PPE Hazard Assessment Tool
- Laboratory Coats
- Other Clothing Considerations
- Hand Protection
- Respiratory Protection
- Eye & Face Protection

In addition to understanding the appropriate uses of various types of PPE, it is equally important to realize that all PPE items have limitations that should be considered in making a selection. Please note, PPE should never be used as a substitute for proper engineering and administrative controls or prudent work practices, but only as an additional measure of protection once all other reasonable precautions have been taken.
Controlling Hazards: PPE
Where can PPE should be found?
Location of PPE on VC-7

- Gowns
- Mask & Face Shields
- Gloves
Controlling Hazards: PPE & General Areas

- Wearing gloves on elevators is **Not Permitted**.
- **Never Touch** elevator buttons or door knobs with gloves.
- Always remember to remove your gloves when you leave your work station.
- Remember to remove disposable gowns before leaving clinical areas. **Never step outside of VC with gowns & gloves.**
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Emergency Management
Emergency Management

Emergency Equipment

- Showers, eyewashes, spill supplies, and fire extinguishers need to be unobstructed
- Don't wait for an Emergency
  - Test eyewashes weekly

Keep Clear of Obstruction
Emergency Management

Reporting Laboratory Emergencies

- Provide:
  - Name & UNI
  - Location (Building, Room)
  - Phone Number
  - Incident Details
  - Any Personal Injury

Reporting Fire, Smoke Conditions or Personal Injury

<table>
<thead>
<tr>
<th>Campus</th>
<th>Public Safety from a Campus Phone</th>
<th>Public Safety from a Personal Phone</th>
<th>EH&amp;S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Center</td>
<td>(212) 305-7979</td>
<td>(212) 305-8100</td>
<td>(212)305-6780</td>
</tr>
</tbody>
</table>
Emergency Management

Chemical Emergencies - Manageable Spills

Call Facilities to mop up spills of non-hazardous materials.

Examples:
- Water
- Bleach
- Other disinfectants

Small amounts of low hazard chemicals & biological spills can be managed by you!
Emergency Management

Chemical Emergencies - Manageable Spills

- Please visit the EH&S Website to review this and other help emergency response videos.

- [http://ehs.columbia.edu/LabEmergencyResponseVideos.html](http://ehs.columbia.edu/LabEmergencyResponseVideos.html)
Chemical Emergencies - Unmanageable Spills

Call EH&S at 305-6780 with:

- Chemical identity if known
- Volume
- Location
- Your name, UNI, and telephone number
Reminder………

- Be familiar with the location of Emergency Equipment.
- Address manageable spills as soon as they occur.
- If this cannot be done immediately, mark off the area & ALERT people around you.
- Take Action!! Call Facilities or EH&S immediately.
Chemical Emergencies - Personal Decontamination

- Flush contaminated eyes, face, arms, and body area with copious amounts of water.
- Remove contaminated clothing.
- If there are no visible burns, wash gently with soap and warm water.
- Seek medical attention, if necessary.
- Inform your supervisor. If there are no visible burns, wash gently with soap and warm water.
# Spills and Emergency Response

## Where to go for Injuries and Health Emergencies

<table>
<thead>
<tr>
<th>Campus</th>
<th>Hours</th>
<th>Students</th>
<th>Public Safety Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUMC</td>
<td>Business-Hours</td>
<td>Student Health Services - 60 Haven Avenue (212) 305-3400</td>
<td>(212) 305-7979</td>
</tr>
<tr>
<td></td>
<td>After-Hours</td>
<td>NYPH Emergency Department - First Floor of the Vanderbilt Clinic (VC)</td>
<td></td>
</tr>
</tbody>
</table>
The EH&S Wall Guide is a useful source of information and we encourage you to locate the guide in your lab and become familiar with its contents which includes:

- Emergency Contact Information
- Emergency Response Procedures
- Health & Safety Reminders
Thanks for your attention!