

## **Instructions for completing the Unit Operations Lab safety inspections using the Safety Inspection Checklist**

This checklist includes four sections: General Lab Safety; Safety Equipment Checklist; CM4110 Equipment; and, CM4120 Equipment.

Use the General Lab Safety and Safety Equipment Checklist sections plus the appropriate course-specific section any time the SIC is used.

### **Instructions for the General Lab Safety section:**

Print the form.

Check each item as required, initial and mark Y or N.

Correct any deficiencies and fill out a PAWS form to report the problem.

Turn the completed form in to Tim Gasperich in B004 when completed.

Complete the safety inspection before the deadline on the morning of a scheduled lab day.

### **Instructions for the Safety Equipment Checklist:**

Print this form at the same time you print the General Lab Safety inspection form. This form is the 2nd and 3rd pages of the General form.

Each equipment item is listed separately so that the condition of all of the safety equipment is verified before starting work in lab.

For each item, as you move across the page, check every column so that each box is initialed and a Y or N is marked.

Safety showers and eye wash fountains must be flushed before every lab day. Run the water until it runs clear.

Correct any deficiencies and fill out a PAWS form to report the problem.

Turn the completed form in to Tim Gasperich in B004 when completed.

Again, complete the safety inspection before the deadline on the morning of a scheduled lab day.

### **Instructions for the Course-Specific Checklist:**

Print out the page that corresponds to the course you are enrolled in.

The format and procedures are similar to the first three pages of the SIC.

This part of the inspection should be performed while lab operations are on-going, not before lab starts.

Check each item as required, initial and mark Y or N.

Correct any deficiencies and fill out a PAWS form to report the problem.

Turn the completed form in to Tim Gasperich in B004 when completed.

# Safety Inspection Checklist for B003/B005/105/107/213 Chem Sci

Inspection Date: \_\_\_\_\_

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<b>Safety Signs and Notification</b>	Y/N   Initials
HF-2 and HF-54 are on (switch on south side of door to B003)	
Evacuation routes posted on the inside of every door to the hallway (7 total)	
All exits are clearly marked and unobstructed (7 total)	
Telephones accessible and labeled with emergency numbers (B005A and 107)	
<b>Personal Protective Equipment</b>	Y/N   Initials
Non-porous, ankle-high safety boots worn while working in the lab	
Long pants worn	
No loose/dangling clothing, hair, jewelry	
Appropriate eye wear and properly marked if using contacts	
Chemical splash goggles worn when handling hazardous chemicals	
Hard hat worn in designated areas	
Earplugs available	
Gloves for thermal protection are available in lab office	
Gloves for chemical protection are available in lab office	
Dust masks available in lab office	
<b>Electrical</b>	Y/N   Initials
Extension cords away from traffic and water	
Extension cords used only for temporary use of portable equipment	
3-pronged plugs on cords with ground wire	
Cords integrity is good, no cracks, frays, or splices	
Cords are not stretched across walkways or do not pose a trip hazard	
1st floor overhead crane is locked and tagged.	
2nd floor overhead crane is locked and tagged.	
<b>Chemicals</b>	Y/N   Initials
Stored in the proper cabinet, label on cabinet door matches cabinet contents	
All chemicals are clearly and properly labeled	
No volatile flammable chemicals stored anywhere except Flammable Cabinets	
Chemicals are being used and transported properly	
<b>Housekeeping</b>	Y/N   Initials
Counters and floors clean and uncluttered	
Ladders in good condition and chained when not in use	
Cylinders labeled, upright, and secure	
Waste containers provided and labeled	
Make sure drain trench plugs are present (3)	
Storage Room (B005B) is neat and uncluttered, supplies are stored properly	

## Safety Inspection Checklist for B003/B005/105/107/213 Chem Sci

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<b>Spill Supplies</b>	not obstructed	clearly labeled	adequately stocked	appropriate for hazards	
B003A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
B005B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
B005 near Liquid Liquid Extraction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
B005 near Flow Measurement and Control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
105 at top of spiral stairway	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
205 (check only if UO Lab activities are scheduled in this room)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
209 (check only if UO Lab activities are scheduled in this room)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>First Aid Kits</b>	not obstructed	signs posted	adequately stocked	appropriate for hazards	
B005, across from lab office	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
105, near South door across from Pumping B experiment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
213, South side of door	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
205 (check only if UO Lab activities are scheduled in this room)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
209 (check only if UO Lab activities are scheduled in this room)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Eyewash Fountains and Safety Showers</b>	not obstructed	signs posted	EW flowed clear	SS flowed clear	inspection tag signed
B003	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B005 by North door	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B005 by South door	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
105 by North door	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
105 by South door	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
105 in NW corner near SRU	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
205 (check only if UO Lab activities are scheduled in this room)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
209 (check only if UO Lab activities are scheduled in this room)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Fire Extinguishers	not obstructed and properly mounted	signs posted	pressure gauge in operating range	pin is installed, tamper seal is intact	no white powder in end of nozzle	hose is restrained	extinguisher is appropriate for expected hazards
B003, North of door							
B003, outside of B003A							
B005, outside of B005B							
B005, near South door to hallway							
B005, near North door to hallway							
105, West side of lab near Fixed Bed Reactor							
105, West side of lab between SRU and Reactor Unit							
105, East side of lab near South door to hallway							
105, East side of lab near North door to hallway							
107, near door to hallway							
213, near door to hallway							
205 (check only if UO Lab activities are scheduled in this room)							
209 (check only if UO Lab activities are scheduled in this room)							

## Safety Inspection Checklist for CM4110 Experiments

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<b>Air Cycloning (B003)</b>	Y/N   Initials
Make sure all guards are in place before starting any equipment	
Check that equipment is properly bonded and grounded	
Do not use with combustible dusts	
<b>Bioprocess Experiments (205 Chem Sci)</b>	Y/N   Initials
All handling of microorganism in hood (besides transfer)	
Proper sanitation	
Proper disposal of waste materials and biohazard bags	
Proper handling of sodium hydroxide	
Cylinders labeled, upright, and secure	
<b>Comminution (104-105 M&amp;M)</b>	Y/N   Initials
Dust collection is running and working properly	
Make sure all guards are in place before starting any equipment	
Safety glasses, safety shoes, dust masks, and hearing protection are worn	
Proper lifting techniques are used	
Lock-Tag-Try any equipment before cleaning it or working on it	
<b>Continuous Stirred Tank Reactors (B003)</b>	Y/N   Initials
Cart wheels are kept blocked	
Agitator immersed in solution when starting and stopping	
Valves closed when starting reaction	
<b>Cooling Tower (B005)</b>	Y/N   Initials
Use ladders safely while taking air flow measurements	
<b>Fixed Bed Reactor (105)</b>	Y/N   Initials
Guards are in place	
Impeller is submersed before it is turned on	
Product discharge line is extended into sink	
Max. temp is 65C	
<b>Flow Measurement and Control (B005)</b>	Y/N   Initials
Clean up spills as they happen	
Keep water away from electricity	
<b>Fluidization (105)</b>	Y/N   Initials
Dusk mask worn when screening sand	
Ear plugs worn when using Ro-Tap	
Slowly open valve on air supply	
<b>Shell and Tube Heat Exchanger (B005)</b>	Y/N   Initials
Insulated gloves worn when operating steam valves	
Be sure condensate hoses extend into the drain	
Open steam valves slowly	
Clean up water spills immediately	

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<b>Liquid-Liquid Extraction (B005)</b>	Y/N   Initials
Protective gloves, apron, and goggles worn to handle glacial acetic acid	
Isopar samples are poured into sample collection container after use	
Sampling valves closed after samples taken	
<b>Membrane Separation (105)</b>	Y/N   Initials
Hazards of enriched N <sub>2</sub> and O <sub>2</sub> are understood	
Air outlet valve is left open while running membrane unit	
<b>Non-Newtonian Flow (105)</b>	Y/N   Initials
Capillary viscometer pressure no greater than 20 psig	
Tanks not overfilled	
<b>Polymer Extrusion (B003B)</b>	Y/N   Initials
Insulated gloves worn when needed	
Heat Shield is on Extruder	
Long sleeves are worn	
Floor is free of water, pellets, & debris	
Proper tools used for scraping polymer	
<b>Pumping A (105)</b>	Y/N   Initials
Pump guards are in place and properly secured	
Tanks are not overfilled	
Water spills cleaned up immediately	
<b>Pumping B (105)</b>	Y/N   Initials
Pump guards are in place and properly secured	
Tanks are not overfilled	
Water spills cleaned up immediately	
Power supply and pump start-up/shut-down is executed properly	
<b>RSST (209)</b>	Y/N   Initials
Specific chemical hazards are known	
Hood fan is operating and blast gate is open	
Insulated gloves used to handle internal vessel	
Operating pressure kept below 325 psig	
Face shield worn when handling hazardous chemicals	
Rupture disk discharge should be toward back of hood	
<b>Vacuum Drying (B005)</b>	Y/N   Initials
Insulated gloves used to operate steam valves	
Dusk mask worn when screening sand	
Ear plugs worn when using Ro-Tap	
<b>Water Treatment (B005)</b>	Y/N   Initials
Use proper lifting techniques	
Tanks are not overfilled	
Water spills cleaned up immediately	