

# Lab Specific Waste Diversion at the University of Colorado Boulder

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UNIVERSITY OF COLORADO BOULDER

CU GREEN LABS PROGRAM



# Learning Objectives

1. Waste diversion programs already in place
  2. How they are maintained
3. Tools of engagement/further collaboration
  4. Materials we hope to address next



# Foam

- ▶ #6 white block foam recycling
- ▶ Eco-Cycle monthly pick-up
- ▶ Paint-grade architectural molding
- ▶ 9336 lbs diverted since 2012

ABSOLUTELY

**NO**

PACKING  
PEANUTS

PLEASE

**NO**

TAPE OR  
LABELS ON  
FOAM

## White Block Foam Only (#6)



**How do YOU know its the correct foam?**

- #6 within the chasing arrow recycle symbol (may have "PS" under arrow)
- White in color
- Block type shape
- Rigid and Firm
- Beads will easily break off with your fingernail



**DO NOT include the following:**

- NO Packing Peanuts
- NO Mailing Labels on block foam
- NO Tape
- NO Stickers
- No Food Grade foam (coffee cups, to-go containers, etc.)
- NO colored foam
- NO #5 foam (or #s other than 6)



# Foam Set-up





# Pipette Tip Boxes & Conical Tubes

- ▶ #5 PP Pipette Tip Boxes
- ▶ #5 PP Conical Tubes
- ▶ Pick-up along with foam
- ▶ Recycled PP pellets
- ▶ ~22,000 lbs diverted since 2012

**PIPETTE TIP BOX & CONICAL TUBE RECYCLING**

**YES**

**#5 PP Conical Tubes** \*

**#5 PP Pipette Tip Boxes**

**\*NO LIDS!**  
Conicals must be clean  
Not previously used with hazardous chemicals, biological agents, & radioactive materials. Previous use with buffers, growth media, and non-hazardous salts/chemicals is OK if conicals are cleaned.

**NO**

**No Pipette TIPS**

**No Compostable Bases**

**No Pipette Bulbs**

**No Clear Trays\***

**No Wafer Grabbers For Refillable Tip Systems**

Additional items:  
- no lab glass  
- no lab gloves

\*Clear Trays go in "Containers" Recycling

303-492-8307  
recycling.colorado.edu



# Pipette Tip Boxes & Conical Tubes Set-up





# Plastic Film


-East Campus

- ▶ #4 LDPE and #2 HDPE allowed
- ▶ Same Eco-Cycle monthly pick-up
- ▶ Filler for composite decking
- ▶ End of each lab corridor location
- ▶ ~1000 lbs diverted since 2012

## Plastic Bags & Film

**YES**

\*stretches and ripples when torn



Dry  
Plastic Bags\*  
Plastic Wrap\*  
Plastic Sheets\*

**NO**

**Additional Items:**

- No Excessive Tape
- No straight edge when torn



Paper/Plastic Combos



Black Trash Bags

CU Green Labs Contact:  
Kathy Ramirez  
greenlabs@colorado.edu  
ecenter.colorado.edu/greenlabs  
303-492-8308

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recycling.colorado.edu



# Plastic Film

## -Main Campus

- ▶ #4 LDPE only, #2 HDPE not allowed
- ▶ Contamination concerns
- ▶ Distribution Center pick-up
- ▶ Partnership with Petoskey Plastics
- ▶ Closed loop stream

# Plastic Film Recycling Pilot



LDPE

**YES**

**LDPE (#4)**  
Ziplock bags  
Shrink wrap  
Plastic wrap  
Stretch wrap  
Air pillows  
Case wrap



HDPE

**NO**

**HDPE (#2)**  
Bubble Wrap  
Packing peanuts  
Liquids / wet plastic  
Hard plastic  
Trash bags  
Biodegradable bags

- Must be dry inside
- Labels are OK
- Please remove large amounts of tape and paper

Contact CU Green Labs if you have any questions!

CU Green Labs Contact:  
Kathy Ramirez-Aguilar  
greenlabs@colorado.edu  
ecenter.colorado.edu/greenlabs  
303-492-8308



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# Plastic Film Set-up






# Metal Lab Containers

- ▶ Biotech and Chemistry Buildings
- ▶ Maintained by lab member
- ▶ Eco-Cycle pick up for Biotech
- ▶ 415 lbs diverted since 2014
- ▶ Distribution Center pick up for Chemistry
- ▶ ~200 lbs diverted since June 2015

 METAL LAB CONTAINER RECYCLING 

**YES**





**Metal Lab \*  
Containers**

\* NO LIDS

*Please*

- DEFACE LABEL, WRITE "EMPTY", and WRITE PI Name
- Vent residual solvents from empty containers in fume hoods for at least 24 hours
- Must not be used with any other chemical than what is on the label
- Remove vermiculite and other materials from cans

 **CU Green Labs Contact:**  
Kathy Ramirez  
greenlabs@colorado.edu  
ecenter.colorado.edu/greenlabs  
303-492-8308 



# Metal Containers Set-up





# Solvents

## -Acetone

- ▶ Chemistry and Biochemistry
- ▶ Received a grant to purchase 2.5 gallon Acetone Distillation Unit
- ▶ Glassware “rinse” Acetone for reuse
- ▶ Benefit for teaching labs
- ▶ 73.1% efficiency, overall savings: \$4,910 (476 gallons)
- ▶ Succession

## Did you know Chemistry & Biochemistry recycle acetone?

### In the first year:

- 240 gallons of acetone collected
- 74% recycling efficiency
- \$2,200 in savings to Chemistry
- Reduces Haz. Waste and disposal costs



### Participating Labs:

Gin Yin Koch

Sammakia Walba

Undergrad Teaching Labs

For more information and to participate, contact CU Green Labs

CU Green Labs Contact:  
Kathy Ramirez  
greenlabs@colorado.edu  
ecenter.colorado.edu/greenlabs  
303-492-8308



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# Solvents

## -Methanol

- ▶ 4-8 L/month methanol with silane contamination coming out of one lab
- ▶ Distiller gets rid of the silane
- ▶ Coomassie Blue Stain used with distilled methanol





# Solvents

## -Ethanol

- ▶ INSTAAR ethanol reuse
- ▶ Required a teamwork approach
- ▶ Reduces hazardous waste
- ▶ Saving \$ for Cell Culture  
(12 gal/yr x \$13/gal = \$1560/yr)
- ▶ 210 gallons diluted since 2014

# Clean Ethanol for reuse from INSTAAR Traps ONLY

DO NOT PUT ANYTHING ELSE INTO THESE CONTAINERS

Keep container closed  
when not adding or  
removing ethanol



UN1170, Ethanol solutions, 3, PG II

Please save  
containers for re-use



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greenlabs@colorado.edu  
ecenter.colorado.edu/greenlabs  
303-492-8308



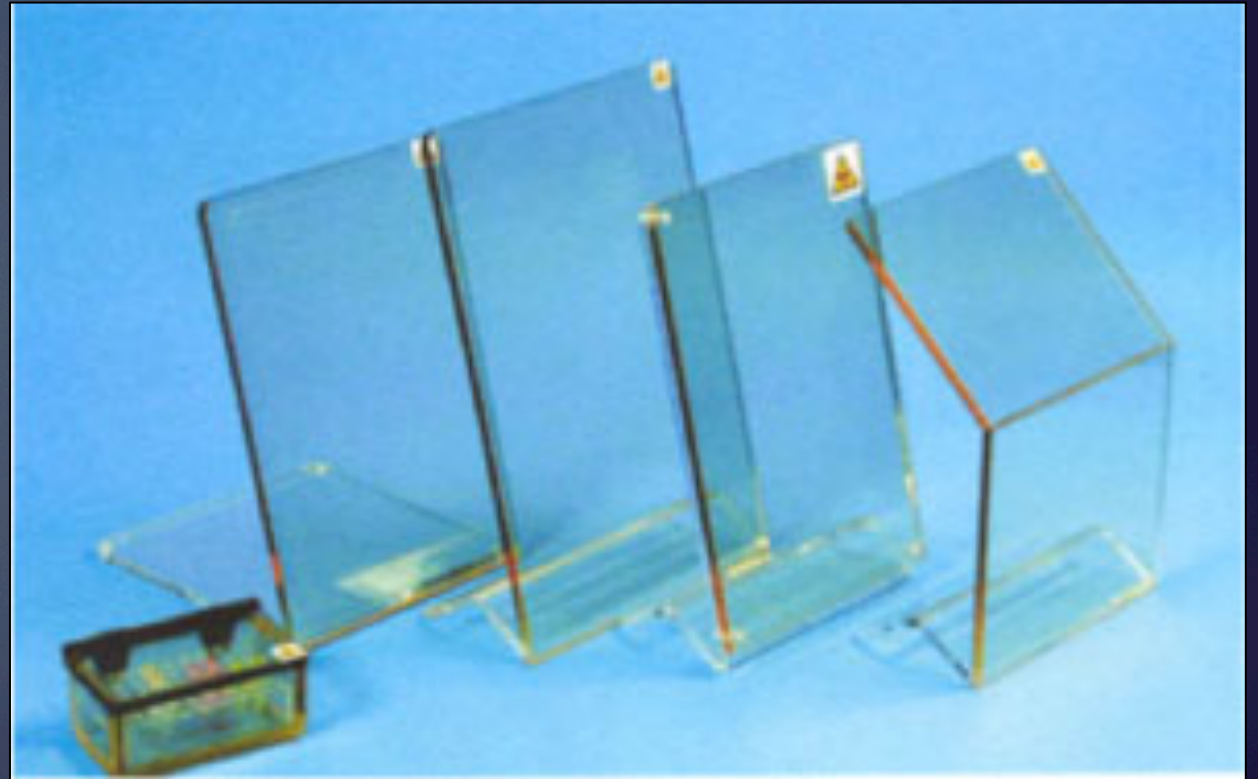
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# EH&S Reuse Programs

- ▶ Lab Plexiglass Shields
- ▶ Radiation team collects plexiglass shields for labs to reuse for radioactive work





# EH&S Reuse Programs

- ▶ Carboys stored in Chemical Store Room for reuse



## Carboy Re-Use Program

These used carboys are available for re-use for the purpose of collecting solvent wastes for disposal. They previously held organic and/or halogenated solvent waste and have been emptied and had a quick rinsing with water.

### Rules to follow:

1. Must be re-used for organic and/or halogenated solvent waste
2. Must have neutral pH between 4 & 10
3. Must have no to low levels of heavy metals
4. NO MERCURY!

For questions, or help determining if your waste fits the requirements, please contact Environmental Health & Safety (EH&S):

hazmat@colorado.edu  
303-492-7845

CU Green Labs Contact:  
Kathy Ramirez  
greenlabs@colorado.edu  
ecenter.colorado.edu/greenlabs  
303-492-8308



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## BEFORE PURCHASING A CARBOY:

Are you using carboys for organic and/or halogenated solvent wastes?  
Do they have a neutral pH between 4 & 10?  
Are there no to low levels of heavy metals?  
Is the solvent free of mercury?

If you answered **YES** to these, you are able to participate in the **Carboy Re-Use Program!**

You can find **FREE** reusable carboys upstairs in the chemical store room by the loading dock!

For questions, please contact EH&S:  
303-492-7845  
hazmat@colorado.edu



# Paper Towel Composting

- ▶ Biotech building pilot
- ▶ Paper towel composting in the bathrooms
- ▶ Bins placed in labs near the sinks
- ▶ Lab member's responsibility to empty bins in the bathroom composting
- ▶ ~4-5 gallons/week





# Why is lab waste diversion so important?

- ▶ >\$8000 in disposal and purchasing savings
- ▶ Engages lab members
- ▶ Gateway for further collaboration



# What's Next?

- ▶ Vivaria animal bedding composting
- ▶ Hexanes, ethyl acetate distillation
- ▶ Brown glass bottles
- ▶ Lab plastic chemical containers



# Acknowledgements

- ▶ I<sup>2</sup>SL
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- ▶ CU Boulder Facilities Management
- ▶ CU Boulder Environmental Center
- ▶ CU Boulder Environmental Health and Safety
- ▶ CU Green Labs Program and Kathy Ramirez-Aguilar
- ▶ Eco-Cycle



# Questions?

## Contact Information:

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