

# Brewery Layout, Organization, And Brew Day Execution

Why less is more

Why planning saves work

Why bigger is not always better

John Blichmann

Blichmann Engineering, LLC

# Mission Impossible?

- Key elements to the perfect brew day.
  - Work space planning and layout for efficiency
  - Organizing equipment and ingredients
  - Brew day execution plan
  - Documentation
- Tips for new brewers, brewers starting all-grain, and advanced brewers, garage brewers & indoor brewing
- Take away: a few good tips and a thought process for laying out your brewery
- Presentation is posted on the AHA website!!

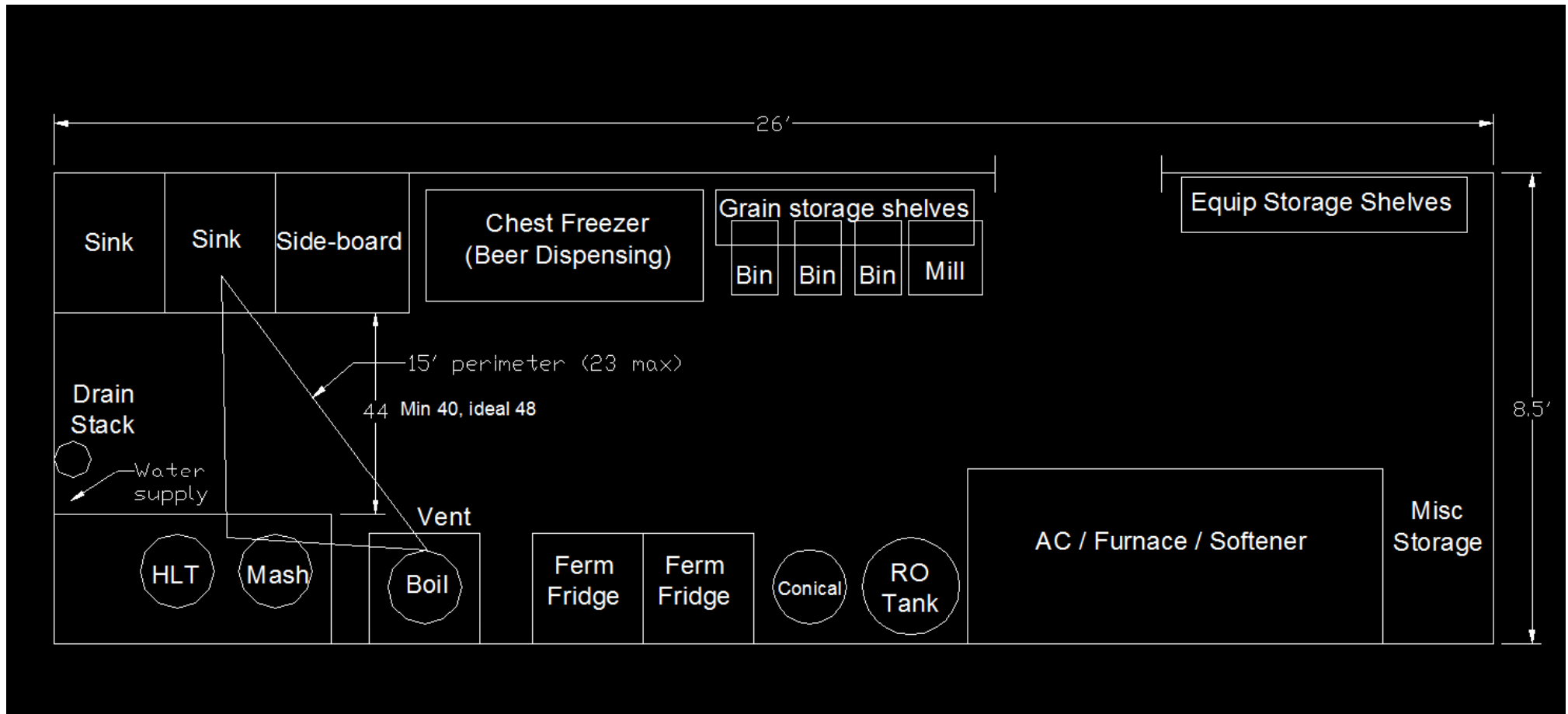
# Brewery Organization

- Basics of Organization
  - A place for everything and everything in it's place
  - Purge the clutter – less is more!!!
- Ingredients
  - Proper storage and accessibility
- Layout
  - Locate utilities and major appliances where used
- Equipment
  - Locate frequently used gear in brew area
  - Move less used equipment out of the brew area
- Software

# Brewery Layout Planning

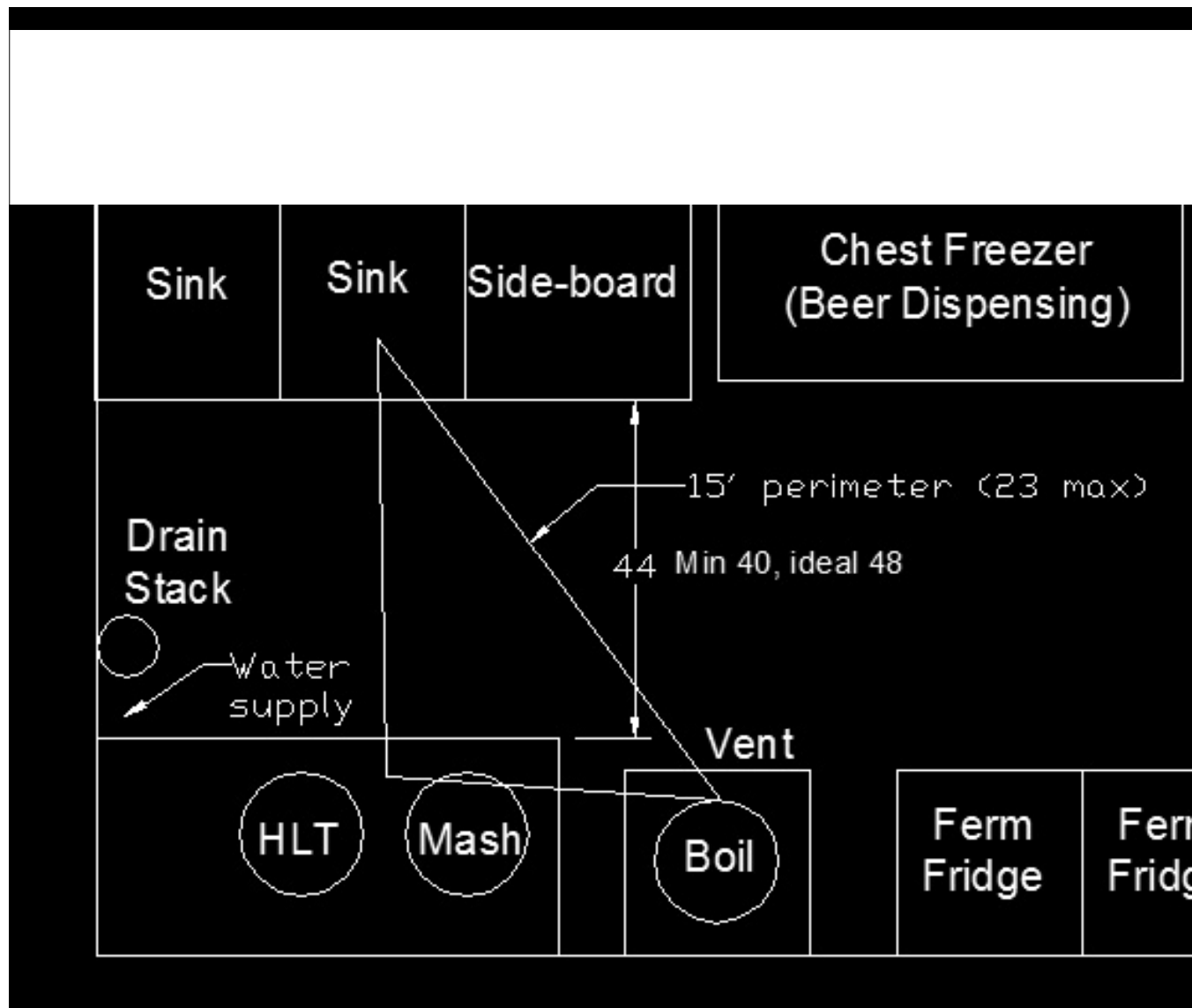
- Plan First – build later
  - Make a scale drawing of your brewing and storage area
  - Walk through your brew day and list all equipment and ingredients used (wrenches to sinks)
  - Add items to your drawing and continue to visualize the brew day on the drawing.
  - Minimize movements
  - Only store equipment in the brew area that is used there
  - Bigger is not better

# Brewery Layout & Ergonomics

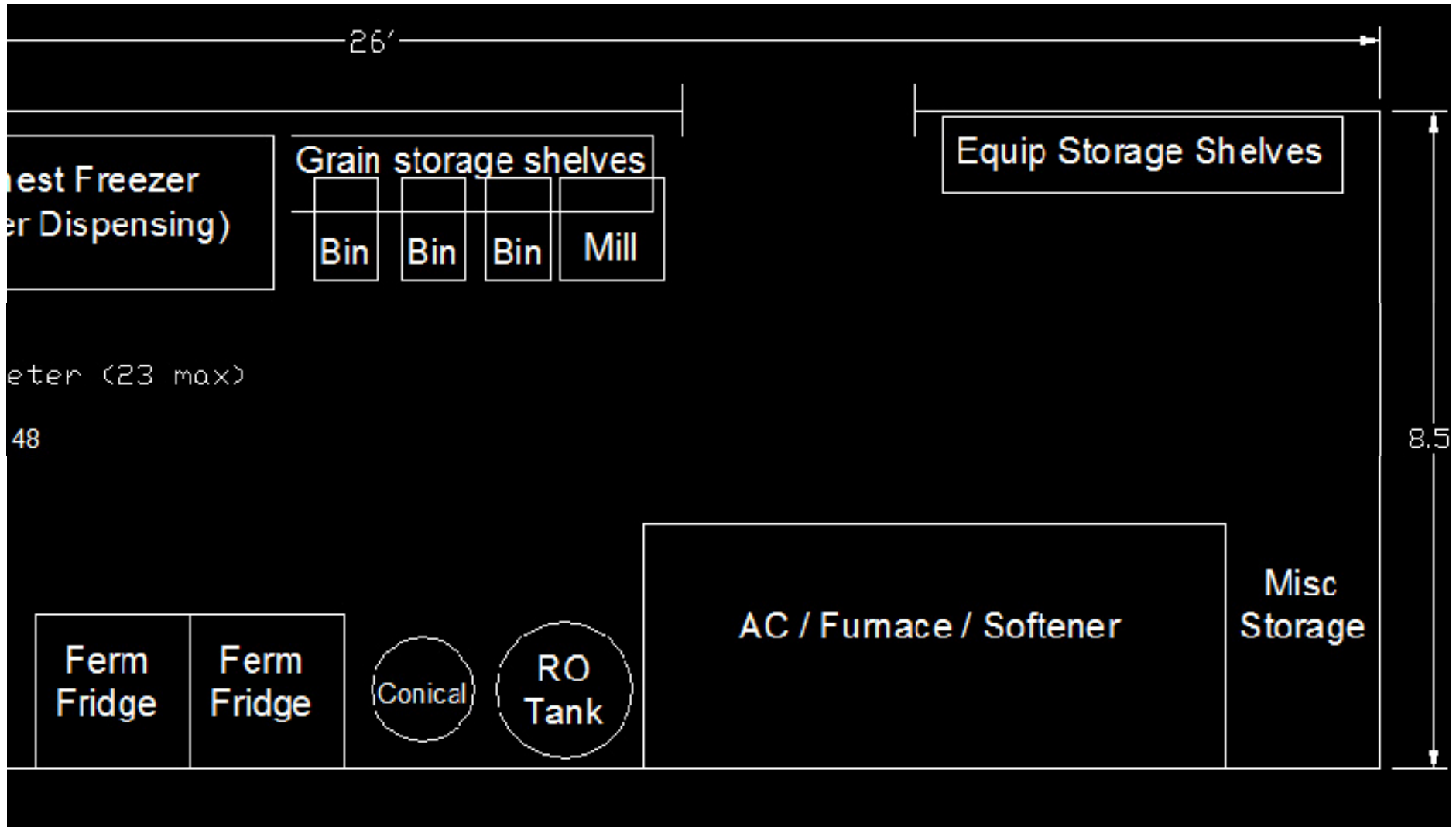


Note: it always looks bigger on paper.....

# Brewery Layout – Brew Area



# Brewery Layout – Storage Area



# Brewery Layout Pics



Workspace For  
Laptop, etc



# Brewery Layout Pics



# Brewery Layout Pics

Brew Area 8.5' X 8'



# Brewery Cleaning – 80% of the brew day

- The sink – the focal point of the brewery
- This is probably the most used piece of brewing equipment. Buy once, cry once.
- Used restaurant supply stores are a great resource – local pickup vs. shipping truck
- Plastic laundry sinks are inexpensive and BIG.
- Floors – non slip and stain resistant. Can't beat a 2 part epoxy floor
- Walls – easy to clean tile or fiberglass sheets

# Brewery Cleaning



Matt Raby  
State of Franklin Homebrewers

# Brewery Cleaning



Sideboard great for cleaning and draining / drying



# Brewery Cleaning



# Brewery Cleaning

The second most important piece of brewing equipment!!



# Brewery Cleaning

Small garden pump from Wal-Mart



Adam Mills



Keep caps on keg posts after cleaning/filling. McMaster part# 9753K47  
\$5 For 100 pc



# Brewery Ventilation

- Removes heat, odors, gasses, steam
- Even electric breweries need ventilation!
- Cautions
  - Vacuum from fans can cause furnace/water heater to back-draft CO. (less of an issue with force draft equipment)
  - Always provide air inlet (open window or make-up duct)
  - Always use a CO detector
  - NEVER leave lit stoves unattended

# Brewery Ventilation Rules of Thumb

- Air flow requirement for excellent ventilation:
  - $\text{BTU/hr} / 30 = \text{CFM}$
  - Example:  $50,000 \text{ BTU/hr} / 30 = 1666 \text{ CFM}$
- For reasonable comfort and CO protection half of this is OK – **HOWEVER** – this assumes you are using a hood over the pot(s)!!!
- Use large ducts and minimize turns
- In-line duct silencers are worth the money!!
- Make sure your fan is rated for at least 140F

# Brewery Ventilation Rules of Thumb

- Use large ducts and minimize turns
  - Each sharp 90 deg elbow = 10ft of straight duct
  - Each 45deg elbow=5ft of straight duct
  - 10" dia duct will handle 400 CFM
  - 12" dia duct will handle 700 CFM
  - 14" dia duct will handle 1100 CFM
  - 16" dia duct will handle 1500 CFM
  - This assumes a MAX of 100ft of equivalent straight duct length. So for a system with (4) 90 deg elbows you could have up to 60 ft of straight duct

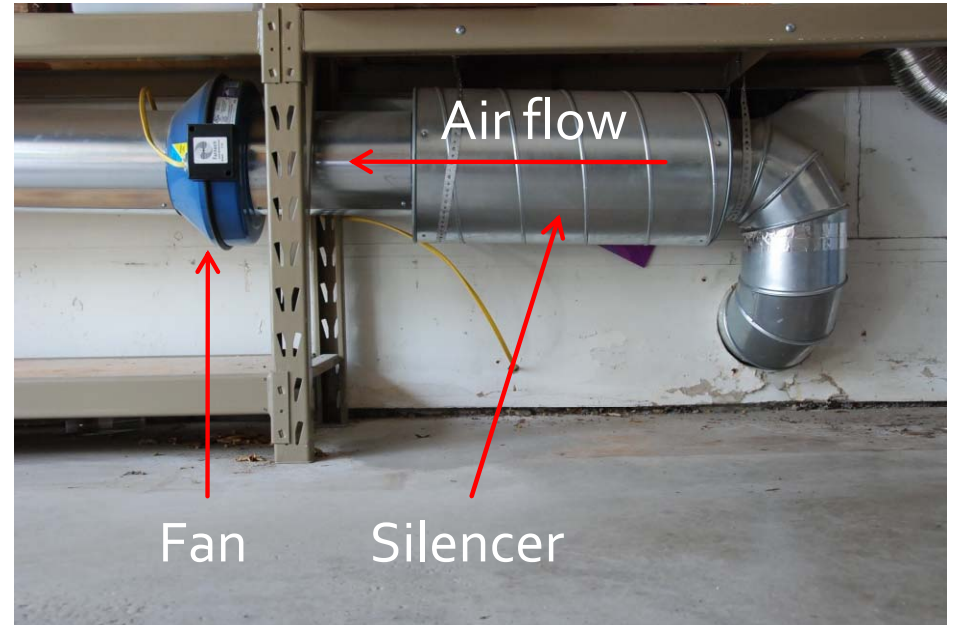
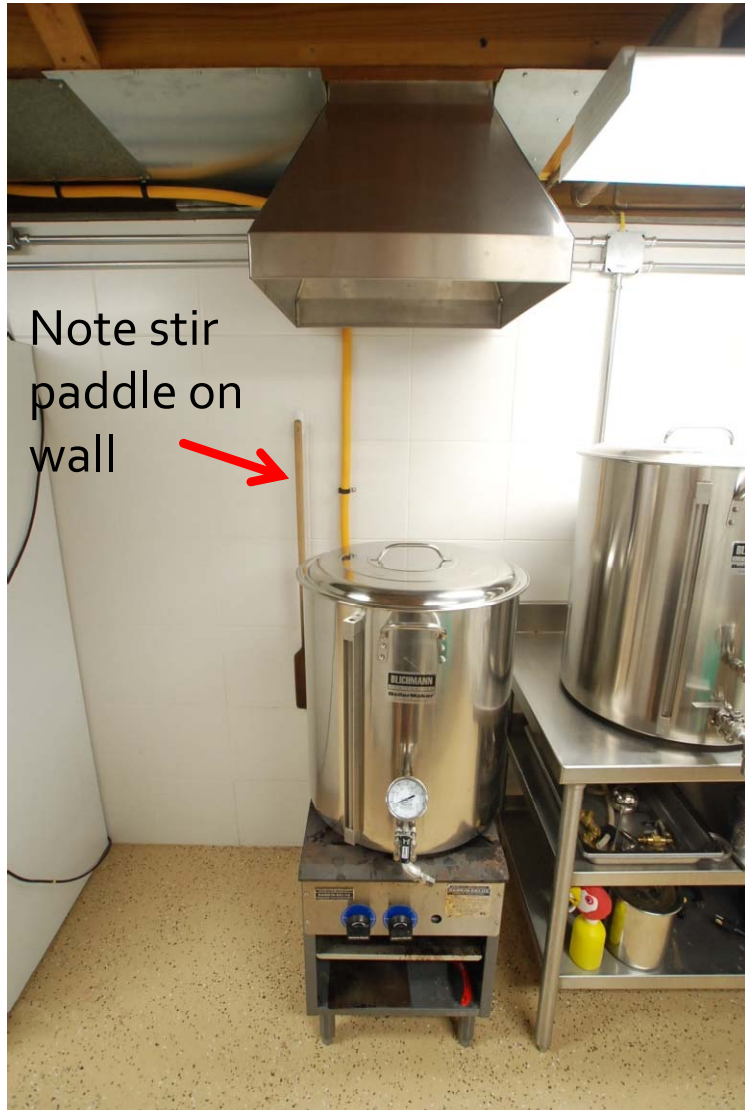
# Brewery Ventilation Pics



Al Feeberg



# Brewery Ventilation Pics



# Brewery Water Supply

- Water – cooling, cleaning, brewing



# Brewery Safety – Heavy Stuff

- Don't lift alone – get help or get a lifting aid!





# Brewery Safety – Heavy Stuff





# Brewery Safety

- Hot – no shirt, no shoes, no brains. And dude, wear pants.
- High – use a stool, or better yet - use a pump. NEVER lift hot pots of liquids!!!
- Health risk - air flow, CO detector if indoors
- Fires – extinguisher nearby (CO<sub>2</sub> if possible) – stay away from structures and wood decks.
- Yes, this one sucks, but don't drink while brewing. You want to win a brewing award, not a Darwin award.

# Brewery Safety – slips and falls

- Epoxy floors with texture – available at home improvement stores – easy to do yourself.
  - Anti slip
  - Easy to clean
  - Highly stain resistant



# Brewery Safety – carboy's

- We've all seen the nasty pics!!!!
  - Wear anti-slip gloves
  - Carry supporting the bottom
  - Keep a cover on them

# Brewery Organization - Ingredients

- Malt/grains storage requirements
  - Keep out of humidity
  - Keep bugs out
  - Keep room temp or below (store in basement, pantry, but not in garage)
- Inventory control
  - Use brewing software
  - Use clear bins – quick view to determine stock

# Brewery Organization – Malt Storage





# Brewery Organization – Malt Storage



# Brewery Organization - Ingredients

- Hops – vacuum seal, store in freezer



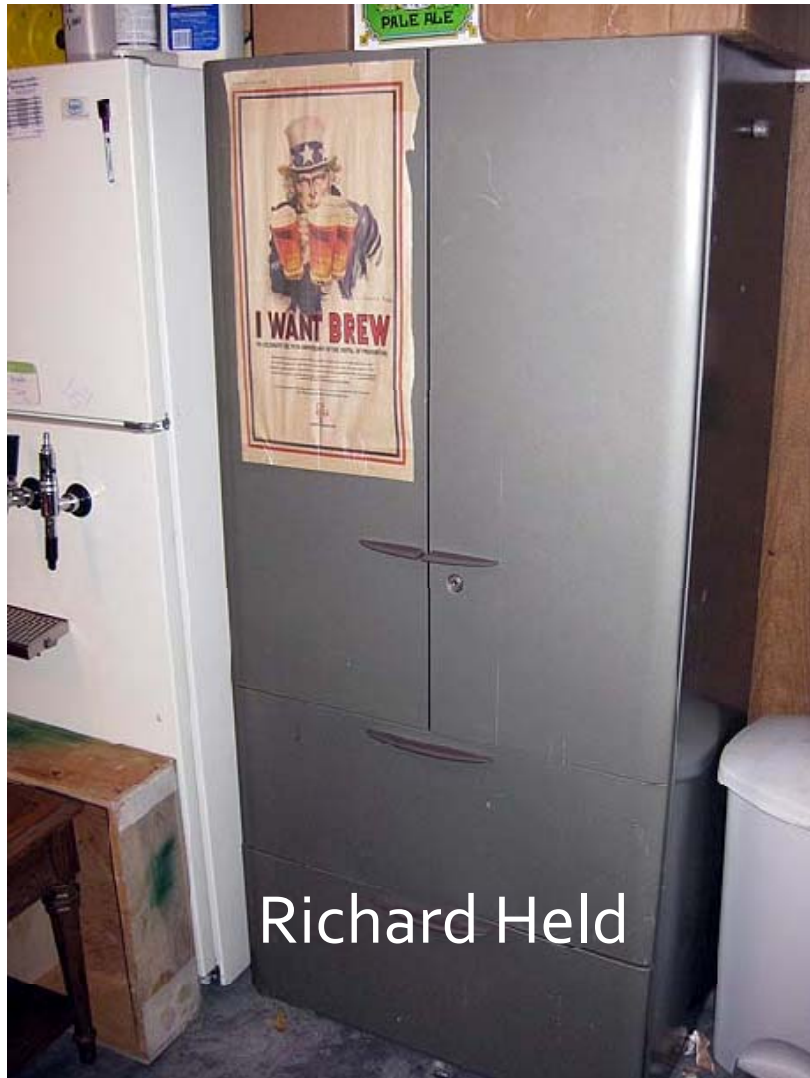


# Brewery Organization - Equipment





# Brewery Organization - Equipment



# Brewery Organization - Equipment



Dave Greenbaum



Tim Runnette



# Brewery Organization - Equipment

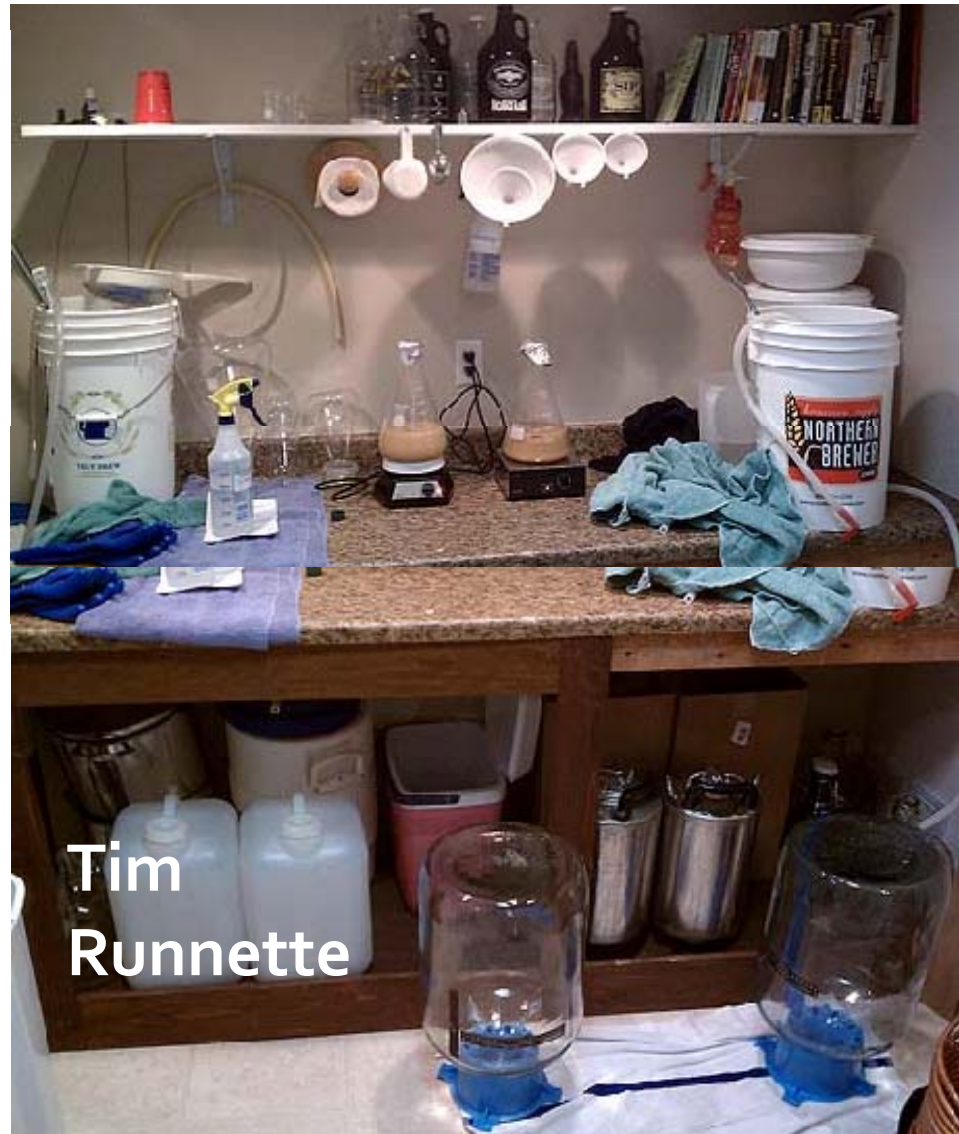


# Brewery Organization - Equipment



Richard Lane  
Carolina BrewMasters  
Charlotte, NC

# Brewery Organization - Equipment





# Brewery Organization - Equipment



Tim Runnette

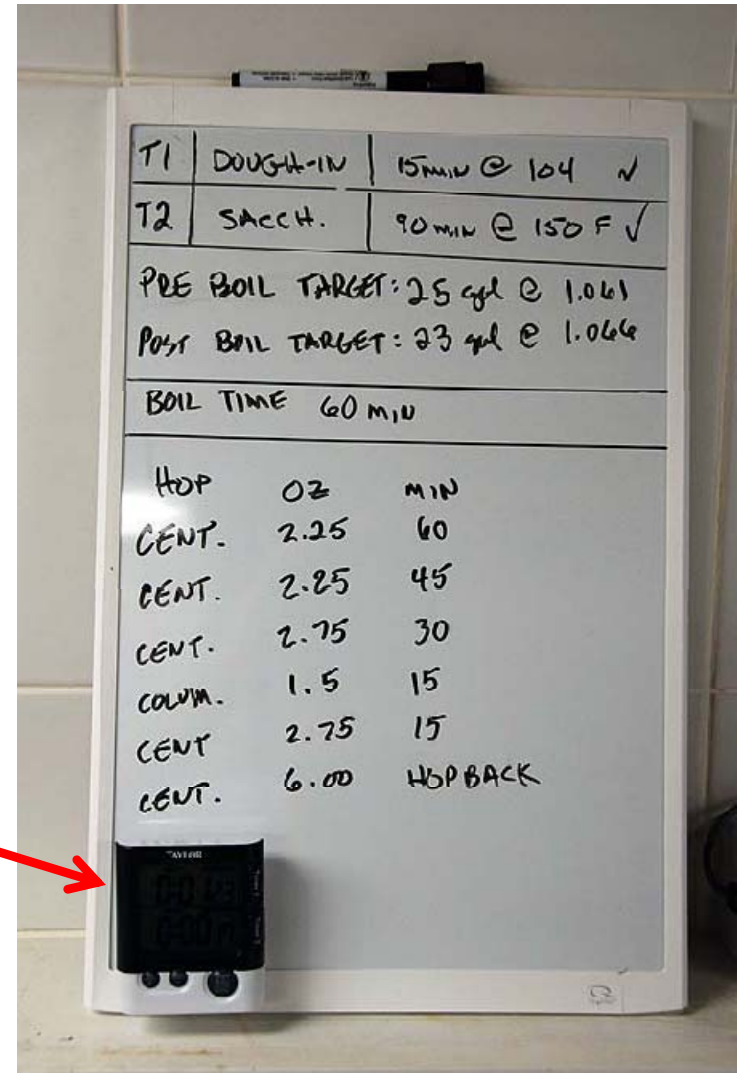
# Brewery Organization – Software/Documentation

- Software – spread sheet, Pro Mash, Beer Smith etc. Use them.
- Knowing the targets and results leads to consistent beer



# Brew Day Tips

- Target brewing parameter white-board
- Brew day flow chart
- Laptop handy or printout



Timer



# Brew Day Flow Chart

- Great for brewers new to all grain
- Great tool to reduce the length of your brew day
- Helps you prevent forgotten steps
- If something goes haywire (stuck mash, missed efficiency) you can react without forgetting where you are

# Brewing Process Flow Chart

One Week  
Before

Finalize recipe  
(ProMash etc)



Make Yeast Starter  
(use Jamil calculator)



Buy Ingredients  
Equipment Check



One Day  
Before

Treat Water  
Crush Grain  
Hit Smack Pack



**Tip!**  
Set Smack Pack alarm  
on your phone

# Brewing Process Flow Chart

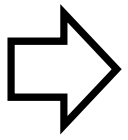
It's Brew Day!!



Heat Strike / HLT  
Water



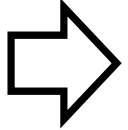
Dough-in / Mash



Sanitize fermentor  
Counter-flow chiller



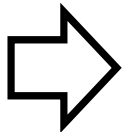
Sparge



Measure Hops  
Yeast nutrient  
Irish moss



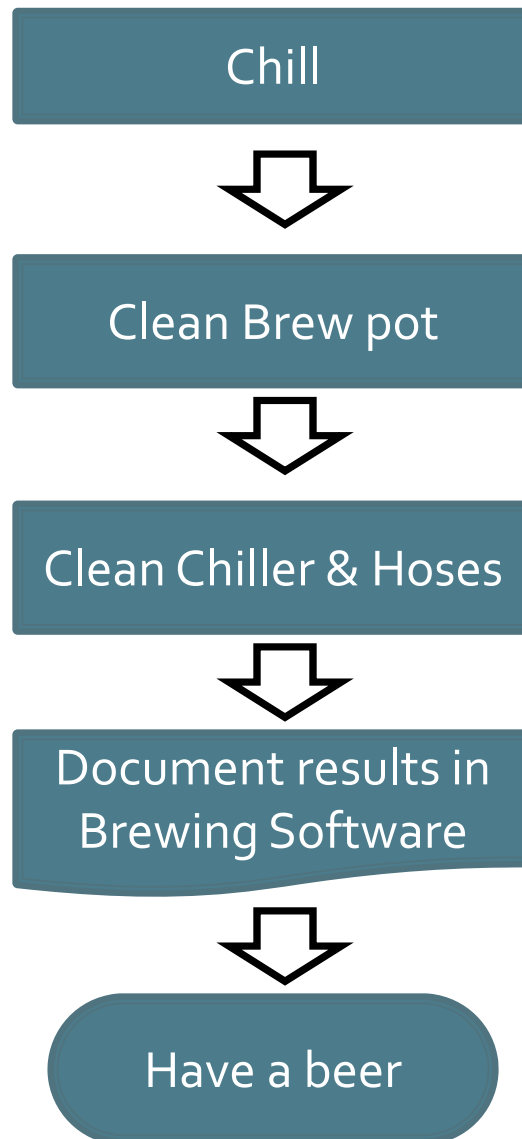
Boil



Clean mashtun



# Brewing Process Flow Chart



# Boil-over prevention

- Ferm Cap (a surfactant, drops during clarification)
- 25% clearance in brew pot (approx 2 times finished batch size)
- Water spray (it doesn't need to be a parrot)
- Dissolve wort/Irish moss/yeast nutrients in wort, then add to pot
- Remote thermometer with alarm





# Boil-wind protection



Travis Hammond

# Fermentation – keeping it cool



Martin Brungard  
Indianapolis, IN



Air circulated through plywood/foam  
fermentation box using PC fan and  
temp controller

# Fermentation – keeping it cool

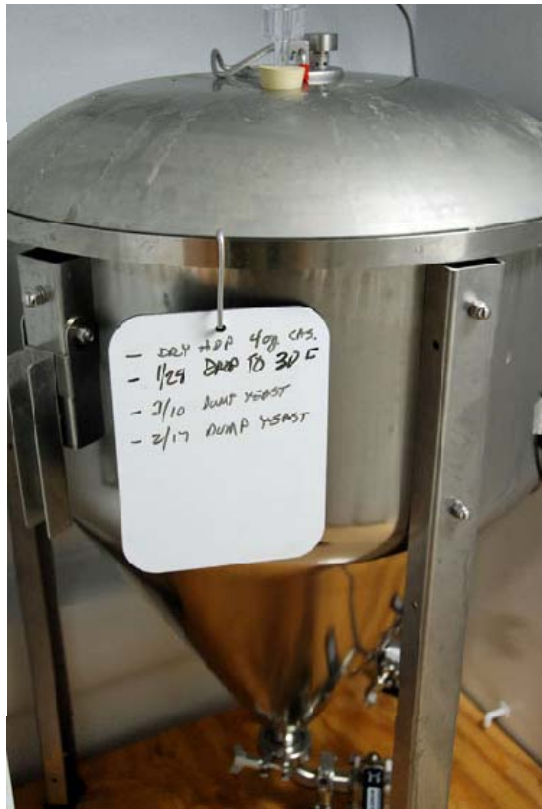


Tape on probe greatly reduces cycling, overcooling  
Easily maintain +/- 2F at high krausen (core vs outside)  
Control well below 30F  
Efficient, reliable, quiet  
Great for finished beer storage too!

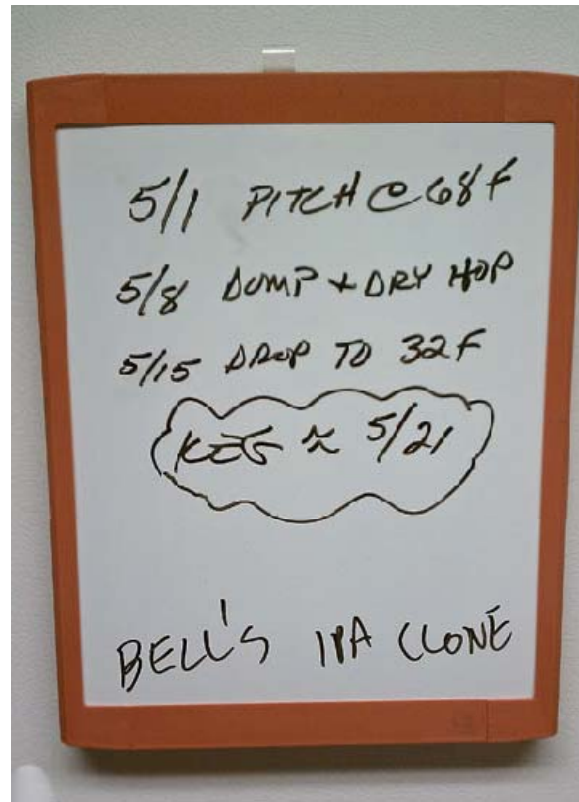
For complete details click the FAQ tab on this page:  
[www.BlichmannEngineering.com/fermenator.html](http://www.BlichmannEngineering.com/fermenator.html)

# Fermentation – keeping track!

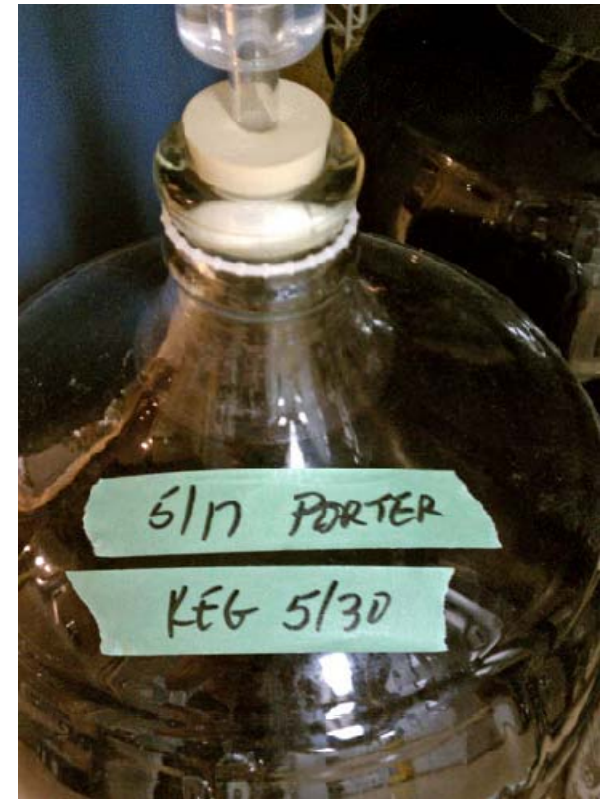
Be sure to document in brewing software too!!



Clip-on



Magnetic whiteboard  
on Fridge



Painters Tape



# Dispensing – the shrine of nectar



Tim Runnette

Plastic adhesive business card sleeves available at U-Line

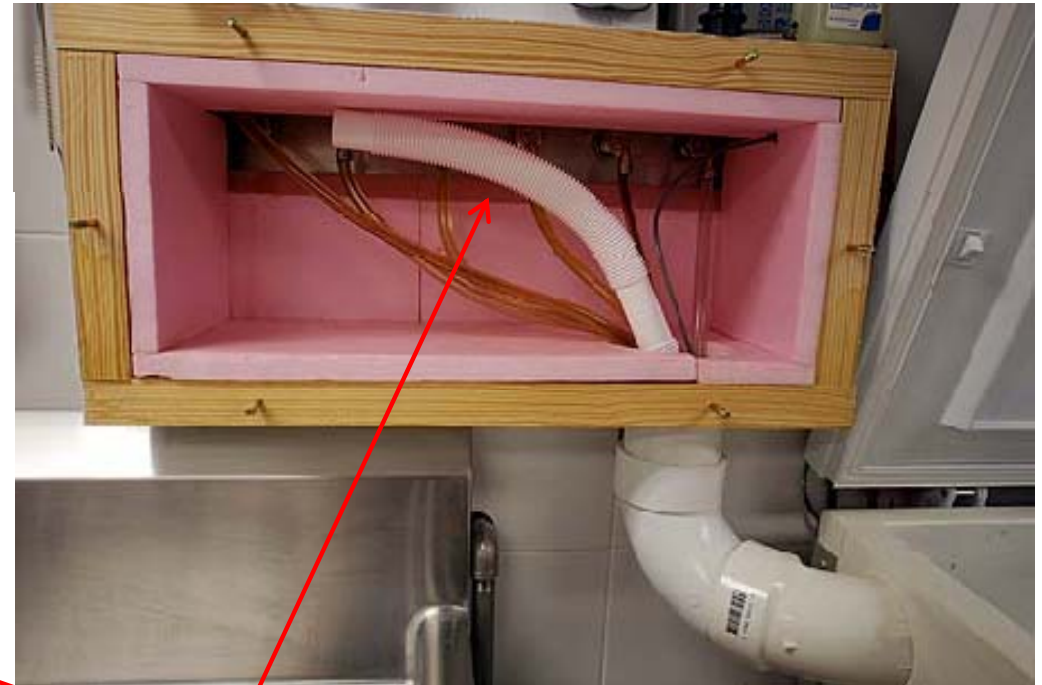
# Dispensing – the kegerator



2X6 frame for CO<sub>2</sub> & beer line passage  
Plywood half deck allows easy access to rear kegs  
(Tim Runette)



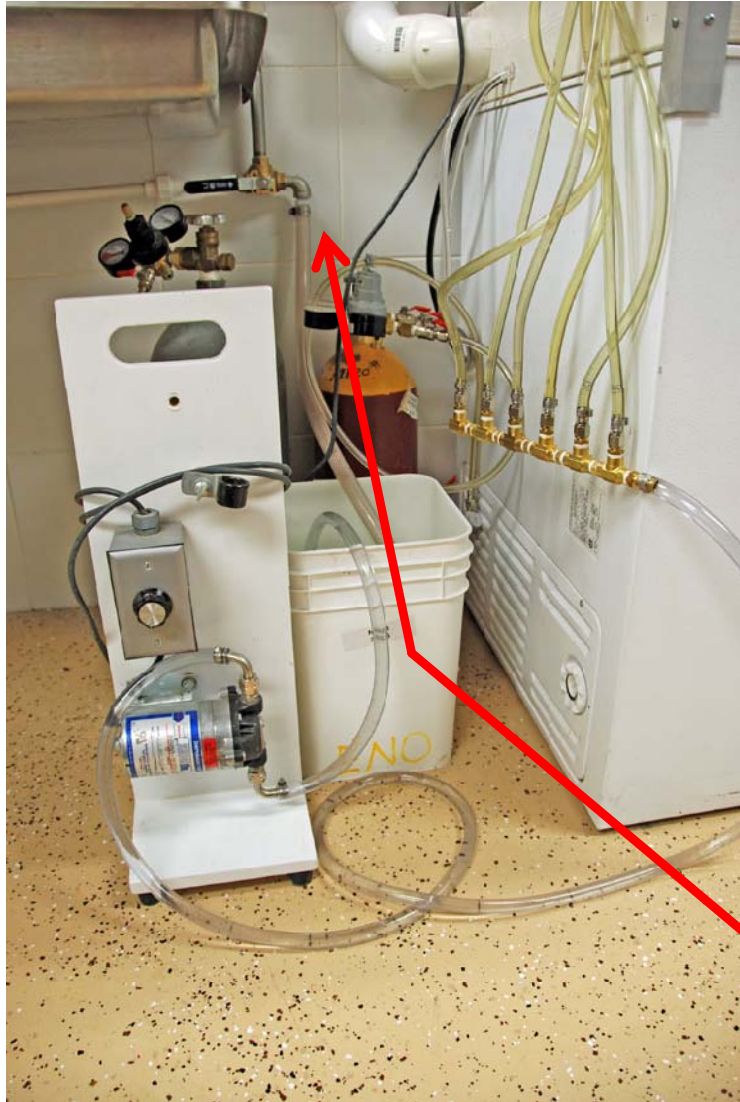
# Dispensing – cooling the lines



Washing machine drain hose

Dayton blower model 2C782

# Dispensing – cleaning your lines



Diaphragm pump – circulate BLC and sanitizer through all tap lines using manifold.

3-way valve drains back to bucket or to drain for normal use



# Summary

- Less is more!
- PLAN - locate equipment & utilities where used
- Organize by function
- Keep infrequently used equipment out of the main brewing area
- Planning & documentation yields repeatability!

# Q&A