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

- Sink
- Sink
- Side-board
- Chest Freezer (Beer Dispensing)
- Drain Stack
- Water supply
- 15' perimeter (23 max)
- Min 40, ideal 48
- Vent
- HLT
- Mash
- Boil
- Ferm Fridge
- Ferm Fridge
Brewery Layout – Storage Area

- Grain storage shelves
- Bin
- Bin
- Bin
- Mill

- Equip Storage Shelves

- Ferm Fridge
- Ferm Fridge
- Conical
- RO Tank

- AC / Furnace / Softener
- Misc Storage
Workspace For Laptop, etc
Brewery Layout Pics
Brewery Layout Pics

Brew Area 8.5’ X 8’
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

Tim Runnette
Brewery Cleaning

The second most important piece of brewing equipment!!
Brewery Cleaning

Small garden pump from Wal-Mart

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

Adam Mills
Brewery Ventilation

- Removes heat, odors, gasses, steam
- Even electric breweries need ventilation!

**Cautions**
- Vacuum from fans can cause furnace/water heater to backdraft 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
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)!!!
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

Note stir paddle on wall

Air flow

Fan
Silencer
Brewery Water Supply

- Water – cooling, cleaning, brewing

Water supply

Cooling water supply & drain
Brewery Safety – Heavy Stuff

- Don’t lift alone – get help or get a lifting aid!
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 (CO2 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
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
Hops – vacuum seal, store in freezer
Brewery Organization - Equipment
Brewery Organization - Equipment

Richard Held
Brewery Organization - Equipment

Dave Greenbaum

Tim Runnette
Brewery Organization - Equipment

Richard Lane
Carolina BrewMasters
Charlotte, NC
Brewery Organization - Equipment

Tim Runnette
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
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
One Week Before
Finalize recipe (ProMash etc)
Make Yeast Starter
(Use Jamil calculator)
Buy Ingredients
Equipment Check
Treat Water
Crush Grain
Hit Smack Pack
Tip!
Set Smack Pack alarm on your phone
One Day Before
Brewing Process Flow Chart

It's Brew Day!!

Heat Strike / HLT Water

Dough-in / Mash

Sparge

Boil

Sanitize fermentor
Counter-flow chiller

Measure Hops
Yeast nutrient
Irish moss

Clean mashtun

Clean mashtun
Brewing Process Flow Chart

Chill

Clean Brew pot

Clean Chiller & Hoses

Document results in Brewing Software

Have a beer
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

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

Martin Brungard
Indianapolis, IN
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:
Fermentation – keeping track!

Be sure to document in brewing software too!!

Clip-on

Magnetic whiteboard on Fridge

Painters Tape
Dispensing – the shrine of nectar

Plastic adhesive business card sleeves available at U-Line

Tim Runnette
Dispensing – the kegerator

2X6 frame for CO2 & 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
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