



URBAN EST 1981 WINERY & CRAFT BREWING SUPPLIES

How a Beer is Made

Going from grain to glass is a multi-step process that can get complicated. This sheet is an overview of the entire process of making beer. This is meant to be a simple run-through of how a beer is made. Inside each section is a reference to some more detailed instructions on that step. This is how a beer goes from an idea to a cold one in hand.

Step 1: What is Going to Be Brewed?

This is the theoretical part of brewing. A brewer must decide a few things before getting started. What kind of beer do they want to make? How much? What will the alcohol percentage be? These are questions that should have an answer before a beer is started. A recipe is all but required for brewing a beer. Recipes define the plan for the beer. We have a wide variety of recipes available at our shop. Recipes can also be found online, or you can visit us and we'll happily produce one. Often, customers will come into our shop and say, "I want to brew a beer just like Wellington SPA." We'll then do our best to try and get a recipe as close to that as possible. After someone has made enough beer they will start to make their own recipes.

A recipe does not necessarily have to be an official document, it can be an idea in your head, but you need to think and plan for what kind of beer you will want to make before proceeding to the next steps.

Total time at this step: 5 minutes to infinity (usually about 20 minutes though)

Step 2: Getting the Fermentables

Beer is made up of four simple ingredients: Grains, Hops, Yeast and Water. This second step is about the interaction between the grains and the water. Put simply, we need to create a fermentable liquid out of the malted barley (grains). This liquid is then fermented by the yeast to create alcohol. This step involves the creation of a sweet liquid called 'wort'. Wort is the foundation of a beer and the most important aspect of brewing beer.

There are two ways that this can be accomplished. There is brewing with a) extract, or b) brewing with all grain.

Extract Brewing

Malt extract is concentrated beer wort. Maltsters will do the work of converting malted barley into a fermentable liquid, which is then condensed into a concentrated liquid or dry form. This allows a brewer to skip the step of mashing during their brew day. Typically, brewers start using extract and move into all grain once they're more comfortable with brewing.

How to Brew with Extract → Simply, add the extract containers to boiling water and proceed to Step #3

All Grain Brewing

Fermentable sugar comes from the interaction between warm water and the freshly milled grain. The grains sit in water that is 150-155°F for an hour. This converts the sugars in the grain to simple ones, which are easily fermented. After that, warmer water is added to the grains to strip them of the remaining sugar on the husks. This is called **sparging**, sometimes also called a **mash out**.

There are two methods that we like for accomplishing this process.

- 1) Brew in a Bag Method → The grains are placed in a giant bag and steeped like a teabag in warm water.
- 2) Mash Tun Method → Grains are placed in a insulated vessel with warm water.

Also, see our section on Mashing

Total time in this step: 30 – 240 minutes

Step 3: Boiling the Wort

Either through using extracts or all grain, you now have a pot full of hot wort. It is time for step 3: boiling the wort.

The boiling stage accomplishes a few things in brewing. First, it kills any potential bacteria that may have been in the grains or liquid. Second, boiling the wort helps break up proteins which helps with taste and clarity down the road. Lastly, it is when hops are added. Whether you are making a lager or a hop heavy IPA, hops are always added in this stage. They provide the bitterness that at the very least balances out the sweetness of the malt.

Check out our tutorial on how the boiling process works.

Total time in this step: 60-120 minutes

Step 4: Cooling Down & Aerating the Wort

Now that the wort has been boiled and the hops have been added, it is time to cool it down so that we can properly ferment the wort into beer!

In order to ferment a beer, it needs to drop in temperature from boiling all the way to 25°C. If yeast is added to the beer before it has properly cooled, then the yeast will be die and the beer will not ferment. Chilling is very important! It can take a bit of time to cool the wort down. Using a wort chiller will dramatically speed up this process. In lieu of a wort chiller, brewers can submerge their brewpots in an ice bath, or leave it over night. These methods take a lot longer, and increase the risk of bacterial infection.

Once the wort is cooled, a hydrometer measurement should be taken to see how much fermentable sugar is available. If the specific gravity is within range, then the wort should then be aerated to help provide oxygen for the yeast. This is the only time that oxygen is good for your beer!

This is also the stage where sterilization becomes extremely important. Up until this point all of the ingredients have been cooked at boiling temps, however now that the heat is gone brewers have to be very careful to ensure everything stays sterile. We strongly recommend using Star San on anything that touches your beer post boil.

Check out our sheet on cooling and aerating the wort for more details. Also, see our sheet on how to use a hydrometer.

Total time in this step: 20-300 minutes (it can take a long time for something at 100°C to naturally drop down to 25°C)

Step 5: Fermenting the Wort

Fermenting is the last step in your brew day (aside from cleaning up). This is the stage where the now cooled and aerated wort is transferred to a fermenter. Yeast is then added and will consume the fermentable sugars to produce alcohol. The fermenter must be sealed and affixed with an airlock (to let the CO₂ caused by fermentation escape) and placed in a location with a consistent temperature that pertains to the style of beer being made. Different styles of beer require different fermentation conditions. A simple ale (which is a type of beer most of us start with) should be fermented between 18-21°C; whereas lagers need to be fermented around 10°C.

Some fermentations take longer than others to complete. It all depends on the style, potential alcohol, and type of yeast. Typically, it is a 10 day HANDS OFF process. The first couple days of fermentation see a lot of vigorous activity in the airlock, then after a couple of days it stops. While it may appear that the fermentation is complete just after a few days, this is not the case. The fermentation will have hit the second stage called conditioning, this is where the final bits of sugar are fermented and where the diacetyl rest happens.

One of the biggest mistake homebrewers make is peeking at their beer during the 10-day fermentation process. We cannot stress this enough – **leave it alone and let it do its thing.**

Here are some in-depth tutorials for the fermentation process:

- 1) How to Ferment an Ale (i.e. a standard fermentation)
- 2) How to Make a Lager
- 3) Primary vs Secondary

Total time in this step: 10-30 days (typically 10-14 days)

Step 6: Racking the Beer (formerly the Wort)

It's been about 10 days; it is now time to check on the beer. First thing to do, take a hydrometer reading. Hopefully the beer has reached its final gravity (the point where no more sugar will be fermented). Assuming that it has, it is time to move the beer to a new vessel. There are a couple of options for what to do next, and it all depends on the kind of beer that is being made, how patient the homebrewer is, and the condition of the beer.

What is left to do once all the sugar has been fermented? A couple of things. For one, clarity can be improved if the beer is able to sit for a bit. Two, numerous final flavour additions can be made in this stage. Things like dry hopping, or adding coffee for a coffee porter can be done post fermentation. If a brewer isn't concerned about these things, then they can proceed to step #7.

This is also the stage where oxygen becomes really important and dangerous. Providing the fermenting beer has been sealed during its fermentation then there was a layer of CO₂ created by the fermentation that prevented oxygen from getting into the beer. Once the lid is removed, the CO₂ vanishes and your beer is now exposed to O₂. Oxygen can rapidly turn a good beer into a sour oxidized mess, and it can take as little as a few hours to occur.

Here are some sheets for important parts of step 6:

- 1) Primary vs Secondary
- 2) Oxygen in Beer
- 3) How to Dry Hop
- 4) How to Use a Hydrometer

Total time in this step: 15 minutes – 3 months (all depends on the beer plan)

Step 7: Packaging the Beer

This is it! The final step. At this point we have fully fermented beer that is flat. It just needs to be packaged so it can be consumed. This is the stage where beer is carbonated. We have a couple of different methods to package beer for consumption.

Option 1) Bottle Conditioning (Secondary fermentation inside of bottles)

This is how most home brewers start. It is as simple as adding sugar to the fermented beer and then moving the beer into bottles. The sugar will ferment inside of the bottle, and the CO₂ produced will be trapped and infused into the liquid – creating carbonation! This process takes anywhere from 7-35 days to complete, typically it takes 2 weeks.

Option 2) Kegging with CO₂

Kegging beer is a beautiful thing. Instead of adding sugar to infuse CO₂ into the beer via fermentation, CO₂ is forced into the beer in a pressurized tank (keg). It takes less time to carbonate, can be controlled, makes cleaner beer, and the beer generally tastes better. Equipment costs for this method are much higher than for bottle conditioning.

Time to carbonate a beer with CO₂ can range from 2 hours – 7 days.

Once the beer is packaged and carbonated, it is time to enjoy! Beer usually lasts about 2-6 months once it has been packaged.

To Recap:

- Step 1) Planning – 5 minutes+
- Step 2) Getting the fermentables (ie, creating the wort) - 30 to 240 minutes
- Step 3) Boiling the Wort (and adding hops) – 60 to 120 minutes
- Step 4) Chilling & Aerating the Wort (Sterility is essential for each step going forward) – 30 to 240 minutes
- Step 5) Fermenting the Wort (Don't Peek!) – 10 to 24 days
- Step 6) Racking & Measuring the Beer – 15 minutes to 3 months
- Step 7) Packaging the Beer – 14 days in bottle to carbonate, or 2-7 days in keg.
- Step 8) Cheers!