

# Small Batch Brewery All Grain Brewing Guide

All Grain beer is made in the same way as professional breweries. You need to mash, sparge, boil, and finally rapidly cool the raw ingredients to get 'wort' (unfermented beer) before fermenting. Small Batch Brewery lets you brew craft beer on a small scale in your own kitchen without the need for specialist equipment.

If you are brewing for the first time read through this introduction to brewing. This can be used for guidance in conjunction with the recipe's **brew day sheet**. The brew day sheet gives specific requirements and a schedule for your recipe, while this brewing guide gives more general information about how to brew. Points in this brewing guide which relate directly to your brew day sheet are numbered and marked in **bold**, to walk you through the brew day.

To brew 'all grain' you will need some basic equipment to be able to accommodate the different stages of the brew.

- **Boiling**. This can be a simple stock pot. Ideally the pot will have a hop strainer and tap, and must allow at least 5 litres extra volume on top of the intended final volume of the recipe pack.
- **Mashing and Sparging**. A 'mash tun' is a separate vessel which allows you to mash the grain with the best results, alternatively a 'mashing and sparging bag' allows you to use your stock pot as a mash tun.
- **Chilling**. To chill the wort after the boil we recommend a wort chiller, alternatively your wort can be cooled by putting the pot into iced water.

To get started you will also need basic fermentation equipment.

- A primary fermentation vessel such as a demijohn, carboy, or fermenting bin with an airlock and bung. A second bin provides extra space for sterilising equipment and allows you to siphon the beer into a secondary vessel to ensure excess yeast trub is not disturbed and incorporated into the finished product.
- Equipment sanitiser is vital to ensuring the success of your brew, making sure equipment doesn't infect your beer with unwanted yeast/bacteria.
- Siphon tubing allows clean and simple transfer of liquid between vessels, while leaving sediment in the fermentation bucket.
- A Hydrometer is vital for checking when fermentation is complete, working out the alcoholic content of the beer, and other diagnosis uses.
- A stick on thermometer gives rough guidance on fermentation temperatures for greater control and diagnosis of problems.
- Beer bottles - buy new or recycle your own glass or plastic bottles. These must be designed for carbonated drinks. If you are using glass beer bottles you'll need a crown capper and caps to seal them. Or use a barrel or keg.

Really good detail on brewing equipment can be found by following this link to our Beer equipment. Frequently asked questions are available on our Blog. <https://brewstore.files.wordpress.com/2010/12/beer-equipment-frequently-asked-questions.pdf>

## All Grain Brewing Techniques Explained

### **Mashing**

This part of the process extracts the fermentable sugar, colour and flavour from your grain.

Heat the required amount of **(1) strike water volume** to the **(2) strike water temperature** in your brewing pot. Add the milled grain to the water, stirring the mix gently but thoroughly to make sure there are no dough balls. The temperature will drop to the target **(3) mashing temperature**. Keep a kettle of boiling water and a jug of cold water ready for use if you need to adjust the temperature. You need keep this temperature as constant as you can while letting the grains mash for the next hour. While you are waiting, heat more **(4) sparge water** to the **(5) sparge water temperature** in another pot or kettle to be used for sparging your grains when the mash is complete.

### **Sparging**

Sparging rinses the remaining sugars out of your mash and brings your wort up to a pre boil volume. After the mash is completed, separate the grains out of the liquid sugary wort by lifting the mashing sparging bag out of the pot or strain them through a sieve. Pour your prepared sparge water slowly and gently over the grains to extract sugar clinging to the grains and achieve your **(6) pre-boil volume**. If you are using a mash tun for fly sparging or grainfather, a sparge arm can be useful here. If you are brewing in a bag you can use a jug to slowly and carefully pour the hot water over the grains. Dispose of your spent grains after the sparge. Once you have achieved your boiling volume, bring your wort to boil.

## The Boil – hop additions

The boil concentrates the sugars of the wort. Adding hops at different stages of the boil give bitterness, aroma, and flavour to the wort.

Bring your wort to the boil. Keep an eye on it to make sure it doesn't boil over. Adjust the heat as necessary to keep a rolling boil which is usually maintained **(7) for one hour**. Do not boil with the lid on the pot, evaporation removes off-flavours from the wort.

Weigh out your **(8) hop additions** from the labelled hop bags according to the brew day sheet instructions. Your first hop addition is bittering hops, which provide most of the bitterness but little flavour and aroma. Hop additions count from minute 60, which is at the start of the boil. Subsequent hop additions are timed from the end, so a 45 minute hop addition goes in 15 minutes after the start, and a 5 minute hop addition is 5 minutes from the end i.e. 55 minutes after the start of the boil! If you have an immersion chiller it is worth placing this in your boiling wort to sterilise it for 10 minutes before the end of the boil, likewise for using Irish moss (i.e. finings).

## Cooling your Wort

When the boil is complete, turn off the heat and turn on your wort chiller, or carefully place the pot into a sink half full of icy water. Gently swirl the cold water round the outside of the pot being careful not to get the cold water inside your wort. Check the temperature, your wort needs to be no more than 23°C before you transfer it to your fermenting vessel.

## Cleaning & Sanitation

A good time to begin sterilising your equipment is while your wort is chilling. Everything that comes into contact with the cooled wort needs to be clean and sterilised. Fill your fermenting vessel with sterilising solution, following the instructions on the equipment sterilising powder. Note that some sterilisation products need rinsing after use. Also sterilise any siphon tubing, airlock, bung, hydrometer, glass thermometer, funnel etc. in a large jug or other container. You don't need to sterilise your bottles now – wait till you're ready to bottle.

## Transferring wort to a fermenter

Once your fermenting equipment is clean, sanitised and your wort is cooled, pour your wort (using a funnel for a narrow necked demijohn or carboy) into your fermenting vessel, and check what **(9) volume of wort you finally collected**. You want to introduce oxygen at this stage, but not at any other point after this when transferring your beer (say at bottling time). Try to avoid pouring in big chunks of hop and protein sediment from the pot but don't worry if some make it in.

## Fermentation

If your wort is short of the quantity your recipe requires, just top it up with some boiled and cooled water, and mix this in either with a sterilised spoon or by placing your bung in the neck and covering the hole with tin foil shake the fermenting vessel gently.

Check the temperature again – you want it to be room temp 18-23°C, any lower and the yeast will stall or ferment very slowly, any higher and you will produce off-flavours. Check your brew with a hydrometer and take a note of the reading – this is your **(10) starting gravity** and is useful to determine the alcohol content when the brew is finished. Pitch your yeast - this simply means adding the full contents of the yeast sachet/vial.

Place a lid or bung on your fermenting vessel and insert an airlock with a small amount of water in it. This stops airborne yeast/bacteria getting into your brew while allowing the escape of CO2 from the fermentation. Leave your beer to ferment at room temperature for 12-24 hours before checking it again, at which point you should see CO2 bubbles coming through the airlock and yeast frothing on the top of the brew. The brew will also go cloudy as the yeast multiplies and starts to eat the sugars in the beer, creating alcohol. The bubbling and froth will calm down as the fermentation progresses. Fermentation is a natural process and can be anything from 7 to 10 days or longer.

## When is it finished?

Check you brew every day after day 7 to see if bubbles are still coming through. The yeast will start to settle at the bottom of the fermenter. If you haven't seen any bubbles for more than 8 hours, check with your hydrometer to see if this primary fermentation is complete. To do this take a hydrometer reading using a sterilised hydrometer straight into the fermenting bin, or remove a sample from a narrow necked demijohn or carboy using a pipette to draw up a sample which should be placed into a trial jar and take your hydrometer reading from this. Write the reading down, discard the sample, and sterilise your trial jar and hydrometer in readiness for its next use. Check the gravity reading against the **(11) final gravity** that is recommended by your recipe. Leave the fermentation another 24 hours and repeat this process. Two identical readings 24 hours apart is the only sure way to determine if your fermentation is complete. Using your starting gravity and final gravity you can now **(12) calculate the ABV** of the beer.

## Packaging

When your primary fermentation is complete you are ready to package your beer. Sanitise your bottles and crown caps/screw tops, or keg along with your siphon tube or auto-siphon and large jug. Remove the lid or bung without disturbing the yeast sediment at the bottom and siphon the beer into a sterilised jug (or you can do this straight into your bottles or a barrel). Gentle siphoning is essential at this stage. Once you have all your beer in the jug or bottles you need to prime the beer. Priming the beer means adding a small quantity of additional sugar which will reactivate the yeast in the beer, but as the bottles or barrel is sealed the CO<sub>2</sub> cannot escape it is forced into the solution producing a carbonated beer. Your recipe will give you exact quantities of **(13) or (14) sugar needed for each brew**, but as a general guide, one half level teaspoon of sugar per 500ml bottle is required. If you are siphoning into a jug or secondary fermenter, add the sugar in bulk and stir, before filling your bottles. If siphoning straight to the bottles you'll need to add sugar to each of the bottles. Leave 2cm headspace unfilled at the top of each bottle. Seal your bottles with a cap or screw top. If adding sugar directly to your bottles shake each gently to mix. If you are using a Cornelius Keg you can choose to force carbonate your beer without the need for priming sugar.

## Conditioning

Store your bottles at room temperature for 10 days. This allows carbonation to take place. Condition the beer at room temperature or cooler (4-23 °C) for another 3 weeks before drinking. It's best to store it upright at this point as any yeast sediment from the bottle conditioning will settle to the bottom of the bottle. When you come to pour your beer try to pour without disturbing the yeast sediment at the bottom for a cleaner beer, but you can drink it even if it's a little cloudy. If you are using a plastic beer barrel, try to position it after priming where you want it to stay for drinking so that you don't disturb any sediment moving it about after it's conditioned. If you do need to move a barrel let it sit for a couple of days before pouring. Cornelius Kegs are transportable having no need for priming sugar.

## Give yourself (and the beer) time

From the start of brewing to getting your beer into your fermenter you'll need around 4-8 hours, once it's in the fermenter your beer will take care of itself and be ready to bottle in around a week. Bottling usually takes up to 2 hours for a 20 litre batch. Once your beer is in the bottles/keg leave it to carbonate and condition for ideally 3 weeks before enjoying – if you really can't wait it should be ready to drink around 10 days or so after bottling but the flavour improves and the beer clears much better if you can leave it a bit longer!

## Good habits

Clean your brewing and fermenting equipment straight after use – you don't need to sterilise them till you need to use them again but dried on yeast is a pain to clean off. Don't use abrasive pads or harsh chemical cleaners on your brewing equipment. Scratches in your kit harbour germs and bleach leaves a taint to your beer. Soak dirty kit overnight or for several days using your homebrew equipment steriliser if you have to. Rinse your beer bottles out after use to make them easier to reuse the next time. We use a light brushing of milk on the back of regular paper to make labels which will stick to your bottles well, but comes off really easily when you need it to.

**For more information or advice please contact Brewstore on**

**[shop@brewstore.co.uk](mailto:shop@brewstore.co.uk) or 0131 667 1296 or check our website for videos / FAQ's and advice.**

**Small Batch Brewery Kits are available in 4.5L, 11L, 19L, 23L All Grain and 11L Extract recipes.**

**Check the website for new and limited edition recipes.**