

**THE
GRAINFATHER**
ALL GRAIN BREWING



**GRAINFATHER CONNECT
INSTRUCTIONS**

DESIGNED BY
BREWERS
— FOR —
**BEER
LOVERS**

**THE FINEST CRAFT BEERS ARE
MADE FROM HOPS, MALTED GRAIN
AND YEAST. THE GRAINFATHER
OFFERS YOU INFINITE
POSSIBILITIES JUST LIKE THE
PROFESSIONAL BREWER.**

**THIS INSTRUCTION MANUAL WILL
GUIDE YOU THROUGH EVERYTHING
YOU NEED TO BREW YOUR FIRST
BEER FROM GRAIN AT HOME.**

**PLEASE ALSO TAKE A MOMENT TO
VISIT OUR WEBSITE AND YOUTUBE
CHANNEL FOR SUPPLEMENTARY
INSTRUCTIONAL MATERIAL.**

www.grainfather.com
www.youtube.com/user/Grainfather

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SAFETY INFORMATION

The Grainfather has been developed for small batch beer brewing. Please only use it for its intended purpose.

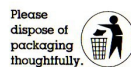
GENERAL SAFETY NOTES

- Read all instructions before using the Grainfather.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- This appliance is intended to be used in household and similar applications such as staff kitchen areas in shops, offices and other working environments; farm houses and by clients in hotels, motels and other residential type environments; bed and breakfast type environments; catering and similar non-retail applications.
- Always unplug the unit before cleaning, during storage or in the event of a fault.
- To protect against fire, electric shock and injury, do not immerse cord/plugs in water or other liquid.
- The boiler, lid and pipes reach temperatures up to 100°C (212°F) and therefore must be handled with caution. Never move the unit while it is in operation.
- The handle on the side is only meant for transportation once the Grainfather is empty and in a cooled, non-use state.
- Save these instructions for future reference.

Safety Cutout - the Grainfather features a boil dry protection system, which will automatically switch off the element if the water level is too low. To reset the safety cutout, switch off and unplug the unit. Empty out any liquid and press the reset button located at the bottom, underneath the boiler.

DISPOSAL

Please protect our environment by properly disposing of the unit. Electronic devices should not be disposed of as household refuse. Take note of the recycling symbol on any plastic parts before disposing. Please use proper facilities when disposing of the unit. More information regarding this can be found from your local or district municipal administration.



TECHNICAL SPECIFICATIONS

TOTAL WEIGHT

10 kg (22 lb)

CAPACITY

30 L (7.9 US Gal)

DIMENSIONS

733 x 386 mm (29 x 15")

STAINLESS STEEL GRADE

304

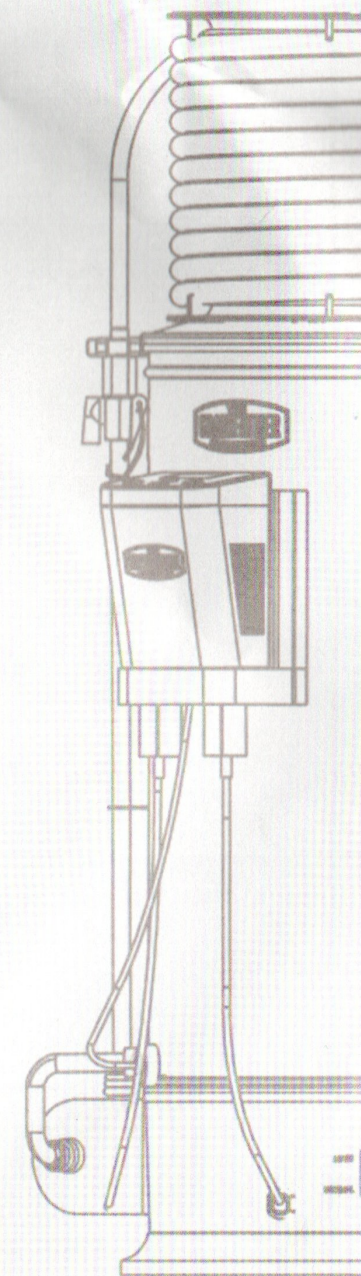
MAGNETIC DRIVE PUMP

6 Watt, 1,800 RPM

POWER

220-240V 2,000 Watts

110-120V 1,600 Watts





ANATOMY/SCHEMATICS

- | | |
|---------------------------------|----------------------------------|
| 1. Pump cover | 24. O ring |
| 2. Pump screw | 25. Recirculation pipe |
| 3. Pump screw | 26. Silicone hose |
| 4. Pump | 27. Tempered glass lid |
| 5. Pump housing | 28. Boiler body |
| 6. Pump silicone tube top | 29. Control box power plug |
| 7. Pump silicone tube bottom | 30. Control box |
| 8. Pump inlet pipe | 31. Pump plug |
| 9. Reset switch | 32. Heating element plug |
| 10. Thermometer probe cover nut | 33. Inner basket lifting handle |
| 11. Thermometer probe cover | 34. Inner basket |
| 12. Element cover | 35. Grain stopper |
| 13. Filter inlet | 36. Overflow inlet |
| 14. Filter | 37. Top perforated plate seal |
| 15. Silicone tube fixing ring | 38. Top perforated plate |
| 16. Bottom boiler bracket | 39. Top overflow pipe |
| 17. Discharge pipe | 40. Bottom overflow pipe |
| 18. Discharge pipe nut | 41. Bottom perforated plate seal |
| 19. Top boiler bracket | 42. Bottom perforated plate |
| 20. Discharge pipe screw | 43. Overflow nut |
| 21. Ball valve | |
| 22. Safety valve seal | |
| 23. Safety valve | |

fig. 1



3.

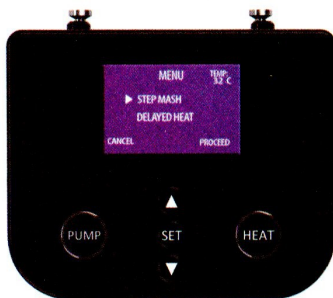
GETTING STARTED

IMPORTANT TO READ - BEFORE STARTING YOUR BREW

- ONCE ASSEMBLED YOU SHOULD CLEAN YOUR GRAINFATHER (INCLUDING COUNTER FLOW WORT CHILLER) BEFORE FIRST USE. **READ P.11 & 12** FOR HOW TO CLEAN YOUR GRAINFATHER AND OTHER EQUIPMENT. THIS IS IMPORTANT BEFORE THE FIRST USE TO REMOVE ANY PROCESSING OILS USED IN MANUFACTURING.
- **READ P.14** IF YOU ARE DOING A SMALL GRAIN BILL, UNDER 4.5 KG (9.9 LB).
- REMEMBER TO HAVE A STERILISED FERMENTER READY FOR COOLING AND TRANSFERRING.

CONTROLLER OPERATION ❄

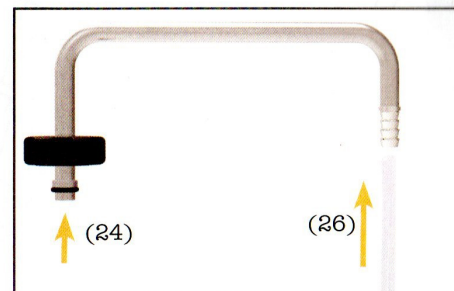
- USE GRAINFATHER CONNECT CONTROL BOX AS PER THE INSTRUCTIONS INCLUDED WITH THE CONTROL BOX. GET FAMILIAR WITH THE INSTRUCTIONS BEFORE BEGINNING YOUR BREW.
- DOWNLOAD THE APP FOR THE BEST EXPERIENCE.



UNPACK THE GRAINFATHER FROM THE BOX.
LAY OUT ALL OF THE COMPONENTS.

Tools required for assembly: Phillips head screwdriver.

ASSEMBLING THE RECIRCULATION PIPE



Check that an O ring (24) is fitted into the plastic knob underneath the rolled groove of the pipe. Then put the silicone hose (26) over the barbed end of the recirculation pipe. Put aside until needed during mashing.

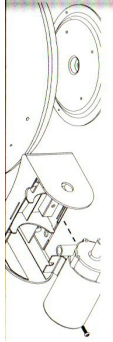
ATTACHING CONTROL BOX



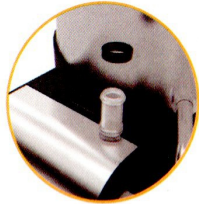
Assemble and attach your Grainfather Connect Control Box as per instructions included with the control box.

4.

ASSEMBLING DISCHARGE PIPE



2.



3.



4.



5.



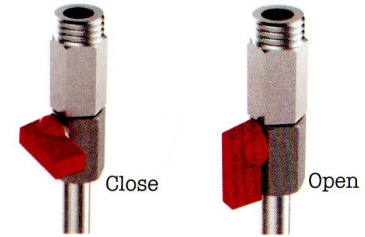
1.



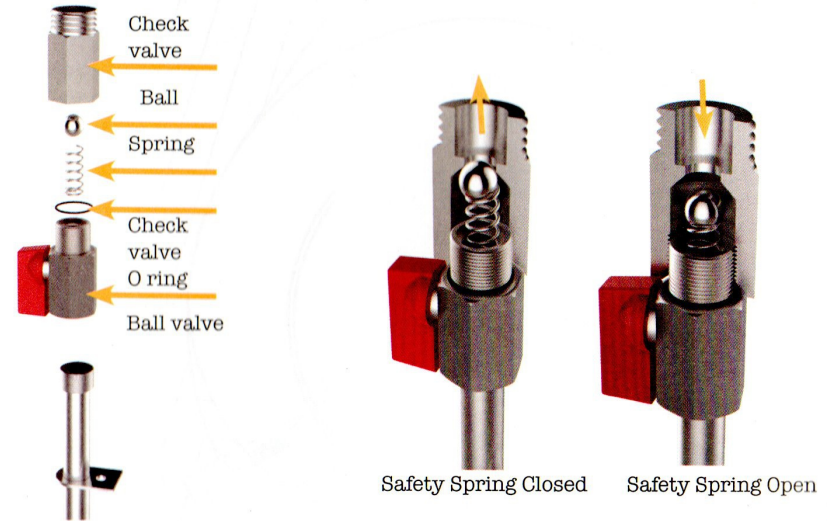
1. Unpack the discharge pipe (17). Drop it down through the holed bracket in the side of the boiler.
2. Take the silicone tube fixing ring (15) and push this over the pump silicone tube.
3. Insert the discharge pipe into the pump silicone tube top (6). It will be a tight fit so it will help to dip the bottom of the discharge pipe in some boiling water so it stretches and the discharge pipe slides in easier.
4. Push the silicone tube fixing ring up so that it goes over the top roll of the silicone tube. This will make it water-tight.
5. Take the screw (20) and nut (18) and secure the discharge pipe to the top boiler bracket (19).

DISCHARGE PIPE OPERATION

BALL VALVE



DISCHARGE PIPE SAFETY VALVE



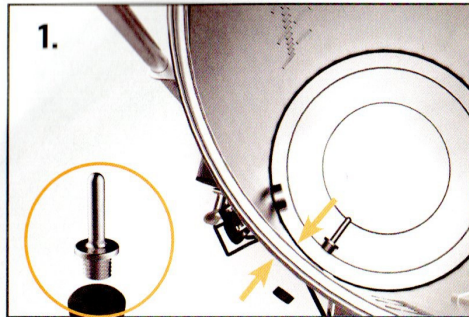
WITH NO INSERT (RECIRCULATION PIPE) THE SPRING AUTOMATICALLY SHUTS OFF ANY FLOW OUT OF THE VALVE.

If at any stage the valves block up, switch off the pump, take the valves apart and clean them.
NOTE: It is good practice to take apart the valve assembly and give it a good clean after a brew and to make sure it is clear from any debris.

5.

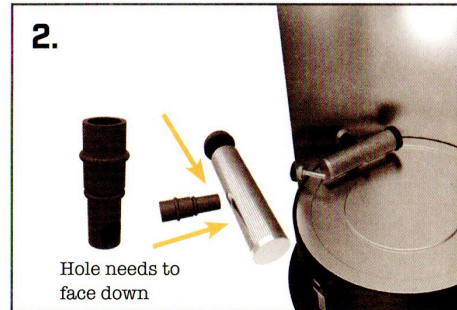
ASSEMBLING THE BOILER & INNER BASKET

INSTALL THERMOMETER PROBE COVER



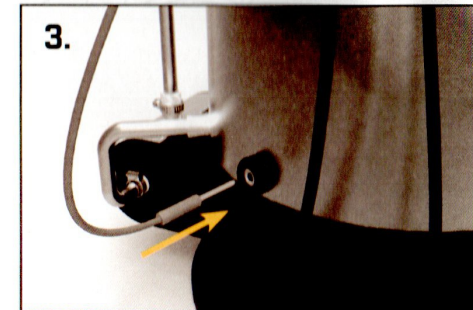
Take the thermometer probe cover (11) and the thermometer probe cover nut (10) and assemble it as shown. Make sure the nut is tightly screwed on.

ASSEMBLE & INSTALL THE FILTER



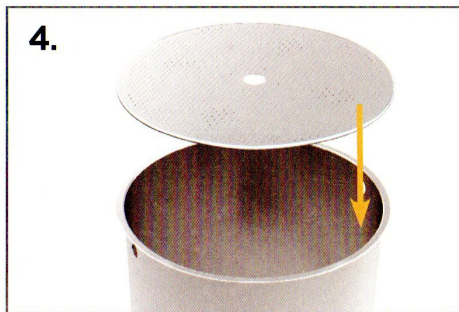
To install the filter (14) insert the silicone tube into the hole of the filter, with the hole in the tube facing down. Push it in so that the filter sits in the groove in the silicone tube. Push the round silicone piece onto the open side of the filter. Now install the filter into the boiler by pushing the silicone tube over the filter inlet (13).

INSERT THERMOMETER PROBE



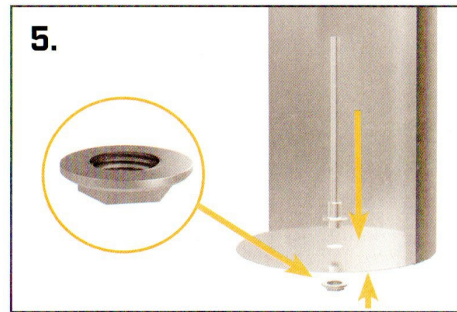
Fit the thermometer probe into the thermometer probe cover (11).

INSTALL BOTTOM PERFORATED PLATE



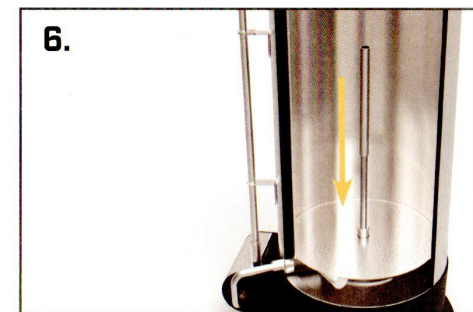
Push the bottom perforated plate (42) all the way down into the inner basket (34). Push down on the sides to ensure it is level. NOTE: You need to be firm when pushing it down, it is designed to be tight fitting. Wet the inside of the grain basket or run some grain dust around it so the silicone seal doesn't stick and it is easier to insert.

INSTALL BOTTOM OVERFLOW PIPE



Remove the overflow nut (45) from the bottom overflow pipe (40). Place the bottom overflow pipe into the hole in the bottom perforated plate (42). Secure the pipe by screwing on the nut finger tight.

INSTALL TOP OVERFLOW PIPE



Push the top overflow pipe (39) over the bottom overflow pipe (40). Make sure the wire springs are facing down.

OPERATING INSTRUCTIONS

MASHING

These are *general* instructions. Please use in conjunction with your all grain recipe kit instructions, if you have one, and your Grainfather Connect Control Box instructions.

MASH WATER CALCULATION

METRIC

1.

$$(5 \times 2.7) + 3.5 = 17$$

Grain bill (kg)

Mash water
volume (L)

OR

IMPERIAL

$$(12 \times 0.34) + 0.9 = 4.98$$

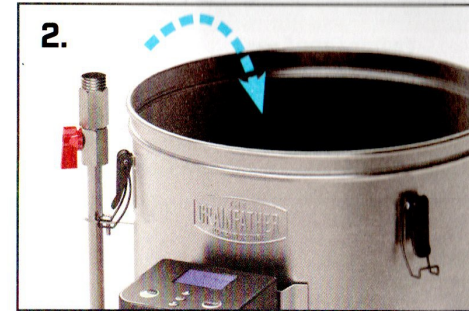
Grain bill (lb)

Mash water
volume
(US Gal)

You must always use this calculation to work out how much water you need for the mash when using the Grainfather (no matter what recipe you use). Replace figures with those appropriate to your brew or see website for online calculator.

ADD WATER TO THE BOILER

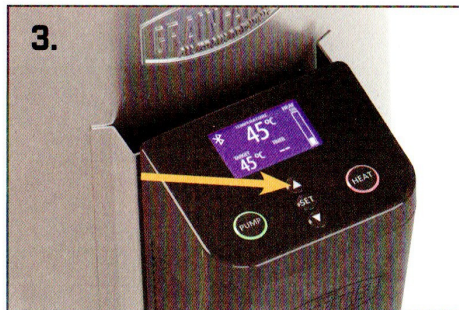
2.



Add the required amount of mash water to the boiler body (28). Make sure the inner basket (34) is removed so that the scale on the inside of the boiler is visible.

SET MASHING TEMPERATURE

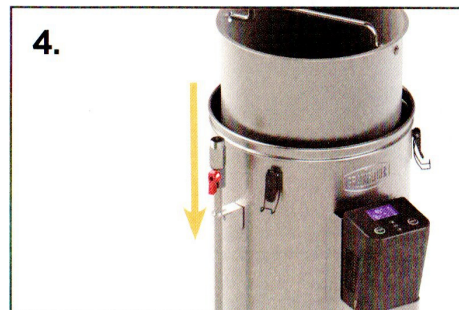
3.



Input the temperature you want to mash at, then switch on the heat.

REPLACE THE INNER BASKET

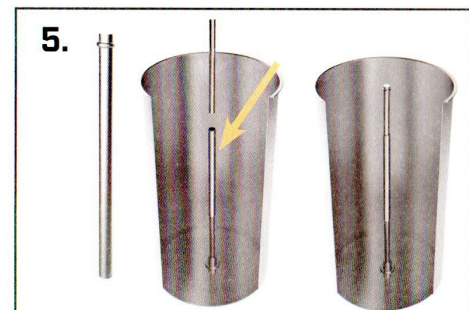
4.



Replace the inner basket (34) making sure the top overflow pipe (39) is fully extended.

COVER OVERFLOW TOP PIPE

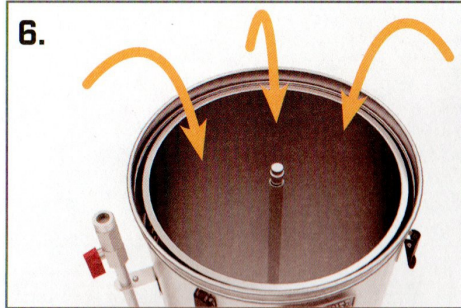
5.



Place the grain stopper (35) into the top overflow pipe (39). The grain stopper has a rolled edge to show the maximum level the top overflow pipe can extend without pulling it off.

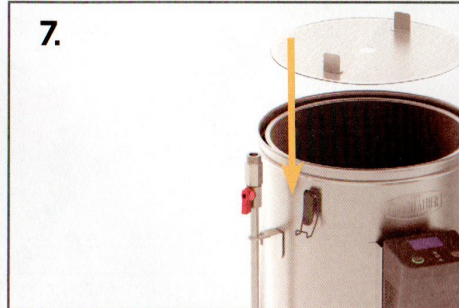
8.

ADD GRAIN



Once the control box indicates the correct mash temperature (from your recipe), slowly add the grain to the inner basket (34), stirring well to avoid any dry clumps.

INSTALL TOP PERFORATED PLATE



Fit the top perforated plate (38) until it reaches the top of the grain bed, it should just rest against the grain, do not compress the grain. Make sure the plate is level so it does not tilt during operation. NOTE: Wet the inside of the grain basket or run some grain dust around it so the seal on the plate doesn't stick and it is easier to insert.

INSTALL OVERFLOW INLET



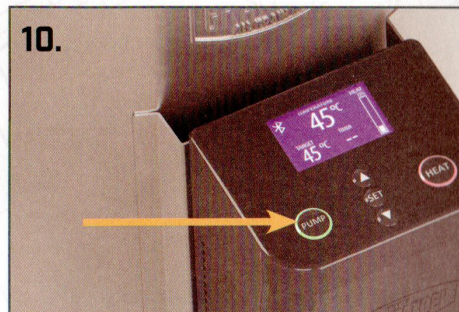
Fit the overflow inlet (36) onto the top overflow pipe (39) and press down until it fits into the hole in the top perforated plate (38). NOTE: Do not press down hard.

ATTACH THE RECIRCULATION PIPE



Place the tempered glass lid (27) on the boiler. Screw the recirculation pipe (25) onto the discharge pipe (17). Make sure it is threaded on correctly. The silicone hose (26) should go through the hole in the glass lid and rest on the top perforated plate (38). NOTE: The clips should not be used to secure the lid, these are for when using the distilling attachment only.

TURN ON THE PUMP



Switch on the pump. The wort flowing through the recirculation pipe should fill up on top of the top perforated plate.

STEP MASHING

Use the below table as a guide for the temperatures you want for each step during mashing.

NOTE: Some recipes will not require all four of these steps.

Steps	Temperature to reach (see your recipe)
Beta Glucan Rest	Approx 45-50°C (113-122°F)
Protein Rest	Approx 50-55°C (122-131°F)
Saccharification Rest	Approx 65-72°C (149-161.6°F)
Mash Out	Approx 75°C (167°F)

Follow your recipe instructions for mashing out.

9.

SPARGING

When using the Grainfather Sparge Water Heater, it can take about 20 minutes to heat 18 L (4.75 US Gal) of water to 75°C (167°F). Start heating your water with enough time to coincide beginning sparging. It is often best to begin heating once completed mashing. This urn has a keep warm feature, so if you reach desired temperature early it will maintain that temperature.

SPARGE WATER CALCULATION

METRIC

1.

$$\left(\left(\text{Preboil volume (L)} + \text{Water loss in boil \& trub (L)} \right) - \text{Mash water volume (L)} \right) + \left(\text{Grain bill (kg)} \times 0.8 \right) = \text{Sparge water volume (L)}$$

Final volume (L)

OR

IMPERIAL

$$\left(\left(\text{Preboil volume (US Gal)} + \text{Water loss in boil \& trub (US Gal)} \right) - \text{Mash water volume (US Gal)} \right) + \left(\text{Grain bill (lb)} \times 0.1 \right) = \text{Sparge water volume (US Gal)}$$

Final volume (US Gal)

Use this calculation to work out how much sparge water you need (assuming you want to collect 23 L (6 US Gal) final volume). Replace figures with those appropriate to your brew, or see website for online calculator.

LIFT THE BASKET



2. Fit the inner basket lifting handle (33) into the holes of the inner basket. Lift the inner basket and twist it 45 degrees to rest it on the support ring located at the top of the boiler.

LOCK BASKET AND SPARGE

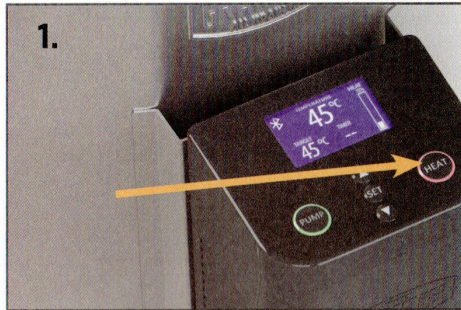


3. Allow the mash liquid to drain into the boiler, gently press the top perforated plate (38) down until it comes to rest against the grain (NOTE: This may be a little hot). Gently pour the sparge water evenly over the grain. Keep the water level approx 10 mm (0.4") above the plate at all times for an even sparge. NOTE: Discard the used grain responsibly, it makes great compost or chicken feed.

10.

BOILING

SWITCH TO BOIL

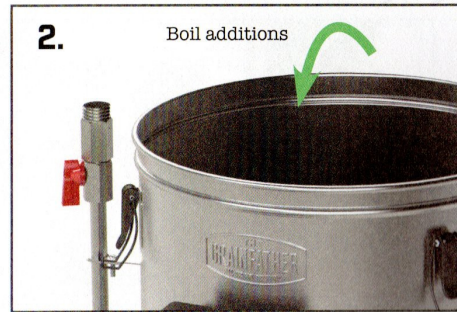


Once the inner basket (34) has been locked in place to drain, you can set the Grainfather to boil to allow the wort to come up to temperature while sparging, which saves time. **NOTE:** Do not let it come to a boil while the inner basket is still on top otherwise you could cause a boil over.

After all of the sparge water has drained through the grain, remove the basket.

- As your wort comes to boil, foam will appear, use your paddle to gently stir and pat this down particularly in the first 5 - 10 minutes so it does not foam over.
- At the start of the boil some nutrients/proteins may collect on the base and it is important to disperse them. Lightly scrape the element on the base of the boiler with your paddle. It also helps to do this a few times throughout the boil. This will prevent the boiler from performing the Safety Cutout procedure (see p.1).
- During the boil, do not replace the tempered glass lid (27), as you may cause a boil over and removing the lid may become dangerous.

ADD HOPS AND TAKE READINGS



NOTE: Give the wort a good stir before taking the preboil SG reading.

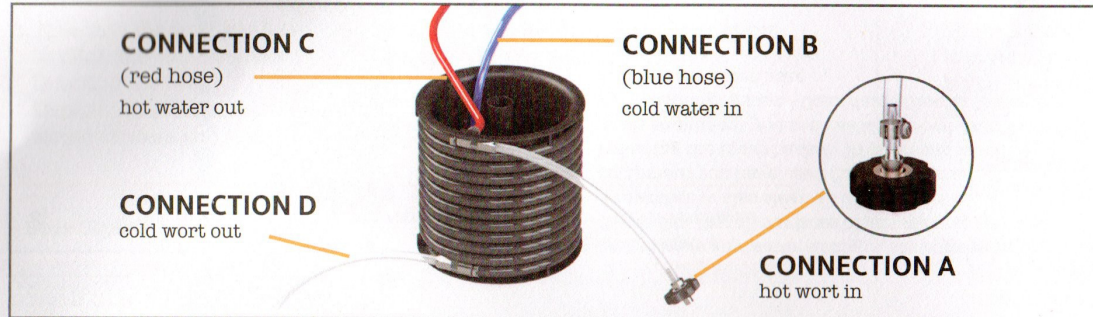
While the wort boils, add your boil additions as instructed on your recipe. Boil times are usually between 60 - 90 minutes.



11.

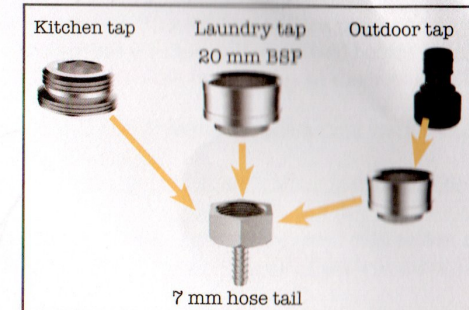
PLUMBING THE COUNTER FLOW WORT CHILLER

ATTACH THE COOLER CONNECTION



Your counter flow wort chiller will come with 4 hoses already connected to connections A, B, C and D. NOTE: The cold water from your tap flows one way and the hot wort flows the other way. Screw the plastic knob onto the discharge pipe to connect your counter flow wort chiller to the Grainfather. Check to ensure there is an O ring installed underneath the plastic knob.

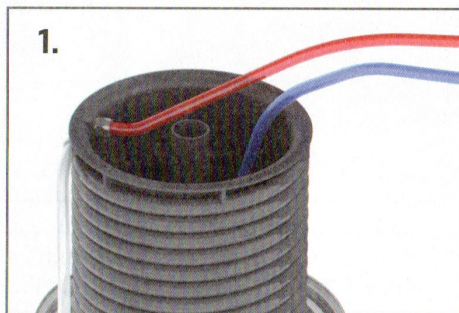
On your first use, run cleaner through the Grainfather and the counter flow wort chiller before brewing.



Make sure you are brewing within reach of a water source. Follow the above diagram to set up the tap adaptors. Connect the end of connection B to the 7 mm (0.3") hose tail.

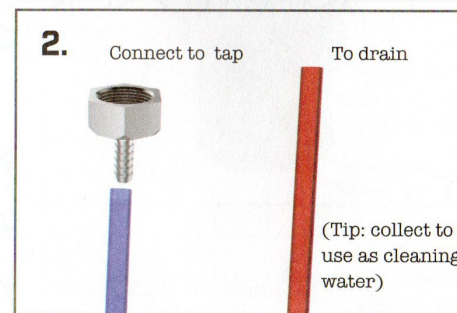
COOLING

CONNECT THE WORT HOSE



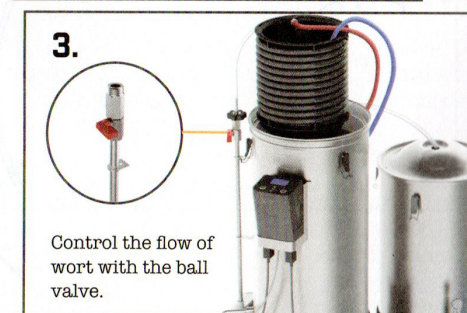
After boiling create a whirlpool by stirring vigorously with your paddle. Then refit the tempered glass lid (27). Place the chiller on the glass lid so its tube fitting on the inside fits into the lid hole to hold it in place. Screw the plastic knob onto the discharge pipe (17). Insert the 'cold wort out' hose (connection D) into the hole in the lid. NOTE: Ensure that none of your wort or water tubes are sitting underneath the chiller. The water tubes should be coming out from the top. If a tube is squashed or there is a kink, this will cause a pressure build up and not allow the liquid to pass through.

CONNECT THE TAP WATER HOSE



The two long hoses (connection B and C) are the tap water hoses. Connect connection B to your tap adaptor, this is where cold water goes in. Connection C is where the water drains out hot as it flows through the chiller. Turn the pump on to recirculate the wort back into the boiler to sterilise the inside of the coil. **Recirculate for 5 - 10 minutes maximum.** NOTE: The Grainfather is designed to cool while simultaneously transferring your wort to your fermenter. You should not cool into your Grainfather.

PUMP WORT INTO FERMENTER



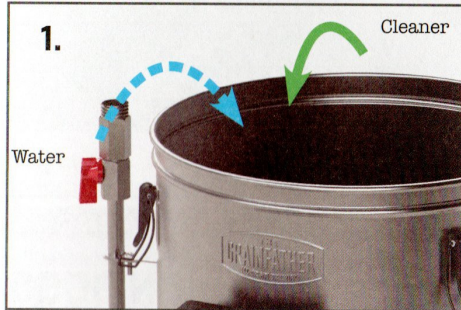
Turn the cooling water on. Once connection D runs cold, switch the pump off and place it inside the clean and sterilised fermenter. Always try to keep the fermenter sealed. Add yeast as instructed on recipe. Take an OG reading of cold wort.

12.

CLEANING

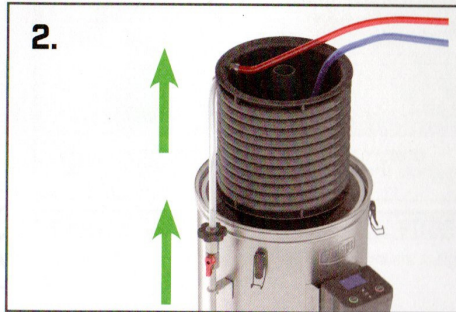
The Grainfather High Performance Cleaner is a CIP (Clean in Place) cleaner specially formulated to work with hard and soft metals that the Grainfather and the chiller both have. If you cannot get hold of this, PBW cleaner is also a great alternative otherwise use an alkaline, non caustic, non staining cleaning detergent that's suitable for use with stainless steel and copper. Avoid chlorine based cleaners, and other corrosive chemicals unsuitable for stainless steel to prevent corrosion, rust or staining.

EMPTY THE TRUB, ADD WATER AND CLEANER



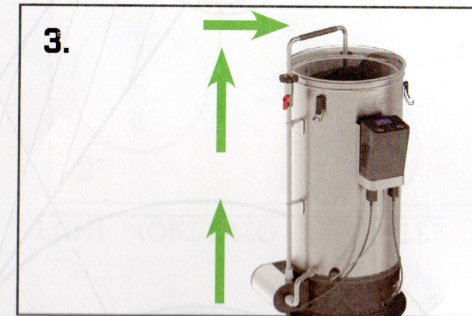
1. Empty out the trub by tipping it down a drain. Remove the pump filter and rinse it, replace it again after rinsing. Fill the boiler up with water and cleaner, as per cleaner instructions.

RECIRCULATE THROUGH THE CHILLER



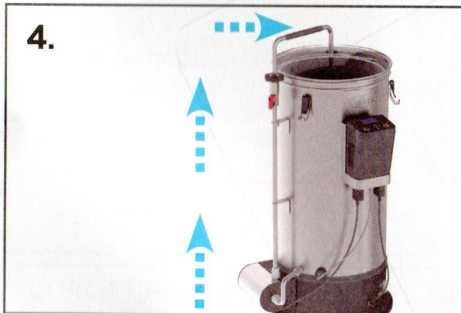
2. Connect the counter flow wort chiller as you would normally. Set the temperature to 55°C (131°F). Place the 'cold wort out' (connection D) hose from the chiller through the hole in the glass lid and let the cleaner recirculate through the chiller for 5 minutes.

RECIRCULATE CLEANER



3. After 5 minutes remove the chiller and connect the recirculation pipe (25). Recirculate the cleaner for another 10 minutes.

RECIRCULATE CLEAN WATER



4. Empty the cleaner and fill the boiler with clean cold water. Scrub the bottom and sides of the boiler with a soft bristle brush. Make sure to recirculate water through the chiller and recirculation pipe.

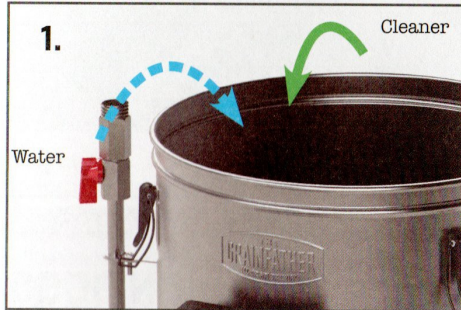
Do not leave any water sitting in the copper pipe of the chiller. Dry all surfaces before storing. Remember to also clean all other pieces of equipment you have used during the process including the inner basket. To clean and sterilise extra equipment you can use Mangrove Jack's two part cleaning system - Cold Water Cleaner Detergent and No Rinse Steriliser.

12.

CLEANING

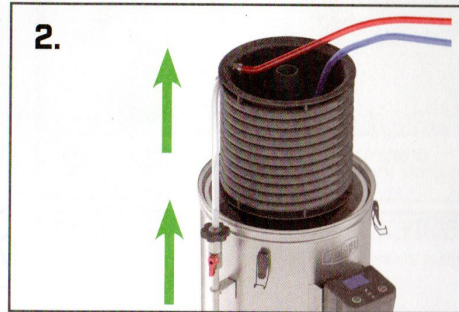
The Grainfather High Performance Cleaner is a CIP (Clean in Place) cleaner specially formulated to work with hard and soft metals that the Grainfather and the chiller both have. If you cannot get hold of this, PBW cleaner is also a great alternative otherwise use an alkaline, non caustic, non staining cleaning detergent that's suitable for use with stainless steel and copper. Avoid chlorine based cleaners, and other corrosive chemicals unsuitable for stainless steel to prevent corrosion, rust or staining.

EMPTY THE TRUB, ADD WATER AND CLEANER



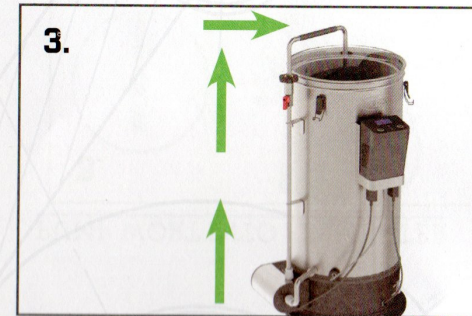
Empty out the trub by tipping it down a drain. Remove the pump filter and rinse it, replace it again after rinsing. Fill the boiler up with water and cleaner, as per cleaner instructions.

RECIRCULATE THROUGH THE CHILLER



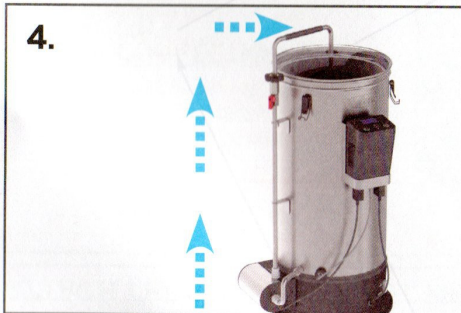
Connect the counter flow wort chiller as you would normally. Set the temperature to 55°C (131°F). Place the 'cold wort out' (connection D) hose from the chiller through the hole in the glass lid and let the cleaner recirculate through the chiller for 5 minutes.

RECIRCULATE CLEANER



After 5 minutes remove the chiller and connect the recirculation pipe (25). Recirculate the cleaner for another 10 minutes.

RECIRCULATE CLEAN WATER



Empty the cleaner and fill the boiler with clean cold water. Scrub the bottom and sides of the boiler with a soft bristle brush. Make sure to recirculate water through the chiller and recirculation pipe.

Do not leave any water sitting in the copper pipe of the chiller. Dry all surfaces before storing. Remember to also clean all other pieces of equipment you have used during the process including the inner basket. To clean and sterilise extra equipment you can use Mangrove Jack's two part cleaning system - Cold Water Cleaner Detergent and No Rinse Steriliser.

FERMENTING & BEYOND...

FERMENTING

- Now that the wort has been transferred into the fermenter, it is important to pitch the yeast immediately. This is to avoid any chance of bacteria infecting the beer.
Depending on what style of beer you are making, you will use a different strain of yeast and fermentation temperatures.

Beer Style	Recommended Fermentation Schedule	Usual Fermentation Temperature
Ales	1-2 weeks in fermenter 2-3 weeks in bottles or keg	18 - 22°C (64.4-71.6°F)
Strong Ales	2 weeks in fermenter 2 weeks in bottles or keg	18 - 22°C (64.4-71.6°F)
Lagers	3 weeks in fermenter 5-7 weeks in bottles or keg	15°C (59°F) until low krausen - 48 hours 10°C (50°F) for 3 weeks 16°C (60.8°F) for 48 hours 2°C (35.6°F) for 5 - 7 weeks
Bavarian Wheat Beers	1-2 weeks in fermenter 1-2 weeks in bottles or keg	18 - 30°C (64.4-86°F)

For more information on fermentation, visit the Grainfather website and see the Mangrove Jack's Dried Yeast booklet. The booklet will provide you with all the information you need to know about yeast, flavours and fermentation.

- Seal the lid, half fill an airlock with water and push it in place and leave to ferment (for most standard fermenters. If using a more sophisticated fermenter, follow your included instructions.).
- At approximately 7-10 days of fermentation, for most beers (check your recipe), use a hydrometer to measure your SG. Fermentation is complete when your SG has been stable for 2 consecutive days.
- When fermentation is complete, transfer the beer to a secondary fermenter and add 1 sachet of Mangrove Jack's Beer Finings. Leave this for 2 days to clear. If you do not have a secondary fermenter add this to your fermenter you're already using.

BOTTLING

You will need to have approximately 30 x 750 ml bottles prepared for the beer. It is very important that bottles are cleaned and sterilised before filling them. If you are using flip top bottles, attach the flip top lids to the bottles when sterilising.

- Fill a sink with cold water and add Mangrove Jack's Cold Water Cleaner Detergent as per cleaner instructions.
- Dip each bottle into the solution and scrub with a bottle brush. Rinse with cold water.
- Empty the cleaning solution and again fill the sink with cold water. Add Mangrove Jack's No Rinse Steriliser as per steriliser instructions. Dip each bottle into the solution, then leave to dry.
- Either use a brew bottler/bottle wand or a syphon to transfer the beer into the bottles.
- Add 5 g (0.2 oz) of white sugar or 2 carbonation drops into each bottle, to prime the brew, and seal.

KEGGING

- Clean and sterilise your kegerator and kegs as described in your kegerator instructions.
- Disconnect the keg and place it near the fermenter. Open the keg lid, let it lie over the opening to avoid oxygen from entering the keg.
- Use a syphon to transfer the beer from the fermenter into the keg. Try to avoid the beer splashing as you do not want to introduce oxygen into the beer.
- Seal the keg lid and connect it to the CO₂. Adjust the CO₂ pressure to 12 psi. Let the keg sit at this pressure for 4 -7 days before drinking.

FORCED CARBONATION

Using CO₂ to force carbonate your beer is a method of carbonating beer quickly. When doing so, there is always a risk of over-carbonating, so please be extremely cautious. There's various methods to force carbonate beer. The below is a commonly used method.

- Chill the keg in the kegerator for 1 hour after transferring the beer.
- Connect the CO₂ line by attaching the grey gas disconnect to the 'in' post on your keg. **IMPORTANT:** Make sure your liquid line (black) is NOT connected to the tap tower at this point.
- Adjust the pressure to 30 psi and leave for 2 days.
- Drop pressure to about 12 psi and leave for one more day.
- Take CO₂ line off, pull the purge valve on top of the keg lid to release some pressure if necessary. Be careful as the beer may foam.
- Chill the keg for 4 hours. Connect the CO₂ line at 8-10 psi and enjoy your beer.

ADDITIONAL INFORMATION

SMALL GRAIN BILLS BELOW 4.5 KG (9.9 LB)

The Grainfather can handle grain bills of up to 9 kg (19.8 lb) but when you want to use a smaller grain bill below 4.5 kg (9.9 lb) the process will be slightly different, unless you have purchased the Micro Pipework (in which case use that and continue using the original calculation). For grain bills below 4.5 kg (9.9 lb), you will need to add additional mash water. Replace figures with those appropriate to your brew.

METRIC

$$(\text{4} \times 2.7) + 3.5 = \text{14.3}$$

Grain bill (kg) Mash water volume (L)

OR

IMPERIAL

$$(\text{8.5} \times 0.34) + 0.9 = \text{3.79}$$

Grain bill (lb) Mash water volume (US Gal)

1. Fill the boiler with the same amount of initial mash water based on the standard calculation above.
2. Add the grain and mix it in.
3. Fit the top perforated plate (38) and overflow pipework (39 & 40). Depending on how small your grain bill is, the top perforated plate may not go down all the way to rest on top of the grain. This is fine, push it down as far as it will go.
4. Fill the unit with additional water until the water level is just above the perforated plate. You must record how much water you add. And then you are ready to begin the mash.
5. Use the sparge water calculation below. Replace figures with those appropriate to your brew.

METRIC

$$(\text{28} - (\text{14.3} + \text{2})) + (\text{4} \times 0.8) = \text{14.9}$$

Preboil volume (L) Mash water volume (L) Additional water (L) Grain bill (kg) Sparge water volume (L)

OR

IMPERIAL

$$(\text{7.4} - (\text{3.79} + \text{0.53})) + (\text{8.5} \times 0.1) = \text{3.93}$$

Preboil volume (US Gal) Mash water volume (US Gal) Additional water (US Gal) Grain bill (lb) Sparge water volume (US Gal)

Or see website for online calculator.

FINAL VOLUME IN FERMENTER

If you collect 28 L (7.4 US Gal) after sparging, you will lose between 8 and 10% during boiling (usually around 3 L (3 US qt), record this as you do this so you can record how much you normally lose) and a further 2 L (2 US qt) in the Grainfather leaving you with approximately 23 L (6 US Gal) in the fermenter.

IF YOU COLLECT TOO MUCH WORT

Then you can boil for longer. This will mean more water will evaporate, giving you a higher OG.

IF YOU DON'T COLLECT ENOUGH WORT

Top up the boiler with water.

NOTE: The longer you boil for the more water will evaporate. This will give you a higher OG, meaning you will have a higher ABV percentage beer, but less volume of it.

GRAIN CRUSH

It is important that the grain used for brewing is crushed to the correct consistency. If the grain is not crushed enough, not enough of the starches will be available for the enzymes to work. If the grain is over crushed, water will not be able to correctly flow through the grain and this can cause a 'stuck' mash.



DISTILLING

The Grainfather is also great for making whiskeys, and other spirits. Once you have made your spirit wash and fermented it, the Pot Still Attachments (Alembic Condenser and Dome Top) can be fitted to the top for distilling. Instructions for distilling are included with the alembic units and online. The clips on the boiler are for securing the Alembic Condenser and Dome Top.

Be aware that in New Zealand it is legal to distil your own spirits and liqueurs for personal consumption. However please note that in certain countries alcohol distillation may be illegal and you may require a licence. Ask for advice or contact your local Customs & Excise Department.



EFFICIENCY

In this example the preboil SG is 1.051. Replace figures with those appropriate to your brew.

$$\begin{array}{c} \text{Last 2 digits} \\ \text{of SG} \end{array} \quad \begin{array}{c} \text{Preboil volume} \\ \text{(L)} \end{array} \quad \begin{array}{c} \text{A} \\ \text{= 1428} \end{array}$$

$$51 \times 28 = 1428$$

$$\begin{array}{c} \text{Grain bill (kg)} \\ \text{6} \end{array} \quad \begin{array}{c} \text{B} \\ \text{= 1740} \end{array}$$

$$6 \times 290 = 1740$$

$$\begin{array}{c} \text{A} \\ 1428 \end{array} \times 100 / \begin{array}{c} \text{B} \\ 1740 \end{array} = \begin{array}{c} \text{Efficiency} \\ \text{82} \\ \text{(\%)} \end{array}$$

Or see website for online calculator.

ABV

FG: After the beer has finished fermentation (when the airlock stops bubbling), you can take the FG reading. This is your final gravity reading and you can use this to work out the alcohol percentage of the beer.

In this example the OG is 1.051 and the FG is 1.011. Replace figures with those appropriate to your brew.

$$\begin{array}{c} \text{OG} \\ (1.051) \end{array} - \begin{array}{c} \text{FG} \\ (1.011) \end{array} \times 131.25 = \begin{array}{c} \text{ABV (\%)} \\ 5.25 \end{array}$$

Or see website for online calculator.

GRAIN WEIGHT AND ABV

In general the ABV of the beer will be similar to the kilograms/pounds of grain. However the ABV will depend on how you mash and ferment, but this can be used as a quick guide to think about before making a beer.

5 kg (11 lb) Grain	5% ABV
6 kg (13.2 lb) Grain	6% ABV
7 kg (15.4 lb) Grain	7% ABV

CALCULATING STANDARD DRINKS

For 500 ml (16.9 oz) of beer which is 5% ABV. Replace figures with those appropriate to your brew.

$$\begin{array}{c} \text{Amount of} \\ \text{drink (L)} \end{array} \times \begin{array}{c} \text{ABV} \\ \text{(\%)} \end{array} \times \begin{array}{c} \text{Density of} \\ \text{ethanol at room} \\ \text{temperature} \end{array} = \begin{array}{c} \text{Number of} \\ \text{standard drinks} \end{array}$$

$$0.5 \times 5 \times 0.789 = 1.97$$

This is approximately two standard drinks.

BE A RESPONSIBLE HOST

Always calculate your beer's alcohol percentage and make your guests aware of this. Drink high alcohol percentage beer with caution.

Advise any friends that you are sharing your drinks with that the alcohol content of the beer may be higher than they are used to.

GLOSSARY

ABV: The measure of Alcohol by Volume.

Beta Glucan Rest: 45-50°C (113-122°F). The beta-glucanases/cytases enzymes which are part of the cellulose enzyme family will carve up the beta glucans in unmalted grains like wheat, rye, oatmeal and unmalted barley. If these gums aren't broken up then the mash can become gummy and cause a stuck mash.

Brewing Water: Water is approx 90% of your beer, so it's important to know its characteristics when brewing all grains. Although water is mainly H₂O molecules, it also contains trace minerals which dictate its hardness and pH. Both have a great impact on enzyme efficiency and yeast activity. The pH and water hardness can be corrected by including additives, such as calcium sulphate, calcium chloride, calcium carbonate, potassium chloride, hydrochloric acid etc.

Counter Flow Wort Chiller: A heat exchanger that has the wort flowing one way and the cooling water flowing the other. The heat transfers from one liquid to another.

EBC: European Brewing Convention, Lovibond Scale. Used to determine the colour of a beer. The higher the number the darker the beer.

Enzymes: Complex proteins that break down starch into simple and complex sugars. Different enzymes activate at different temperatures. The mash temperature is adjusted to activate the correct enzymes to leave a range of simple and complex sugars in a mash. Yeast can only consume relatively simple sugars so more complex sugars formed in the mash will result in a higher FG and more body in the beer. Simple sugars get converted to alcohol.

Ferment: The action of yeast converting sugars to alcohol and carbon dioxide.

Fermenter: A vessel to hold the brew. This can be either plastic, glass or stainless steel.

Final Gravity (FG): The measurement of gravity at the end of fermentation.

Grain Bill: The grains used in a recipe. The bigger the grain bill the higher the alcohol percentage.

Hop Addition: The quantity and type of hops added to a brew. Hop addition time is expressed as minutes from the end of the boil.

Hydrometer: A glass float with a graduated scale. If the liquid is water at 20°C (68°F) then it will measure 1.000. If the liquid contains sugar (malt) then the hydrometer will float higher in the liquid and the measurement will be higher than 1.000. During fermentation the sugars are converted to alcohol and this reduces the gravity.

IBU: International Bitterness Units. Used to determine the bitterness level of a beer. The higher the number, the more bitter the beer.

Mash: The mixture of grain and water. This is held at different temperatures throughout the process to activate different enzymes.

Mash out: This is to ramp the temperature up to 75°C (167°F) and allow the wort to recirculate for 10 minutes. This denatures the enzymes and prepares the grain for sparging.

Original Gravity (OG): The measurement of gravity at the beginning of fermentation.

Protein Rest: 45-55°C (113-131°F). Some European malts are not fully converted by the malthouse. If they aren't, the mash will benefit from a rest in this range. This helps

improve the head retention and avoid chill haze.

Refractometer: An extremely useful tool to establish the Specific Gravity (SG) of the wort before and after fermentation. This instrument measures the refractive index of the wort/beer. The higher the index, the more sugar that is present. Results are often displayed in degree brix and SG. Refractive index of water is 0 degree brix, and 1.000 SG. You only need a few drops so it is quicker and more convenient than using a hydrometer.

Saccharification Rest: 55-72°C (131-162°F). The most used temperature for the saccharification rest is 67°C (153°F). There are two enzymes in play here. The Alpha amylase enzyme 65-72°C (149-162°F) and the Beta amylase enzyme 55-65°C (131-149°F). Both favour different temperature ranges. Generally the higher the temperature the more unfermentable sugars in your mash, which increases the body.

Sparge: The action of rinsing the grain with hot water after mashing. This ensures all of the sugars are extracted from the grain. Preboil SG is taken after sparging.

Specific Gravity (SG): The measurement of the density of a liquid. Measured with a hydrometer or refractometer.

Step Mashing: This is to mash in separate stages. The steps generally start with a protein rest and end with a saccharification rest. This method is used to achieve different characteristics in a beer.

Trub: This is the mixture of proteins and hops that remains in the boiler after the wort is pumped out through the chiller.

Wort: The liquid formed when water and grain are combined and held at the correct temperature for the enzymes to produce malt.

Whirlpool: After boiling has finished the wort can be stirred gently in one direction to create a whirlpool so that hops and trub collect in the centre of the boiler. The wort can then be run off into the fermenter leaving the trub behind. This isn't really necessary with the Grainfather as the pump filter prevents this from being pumped into the counter flow wort chiller.

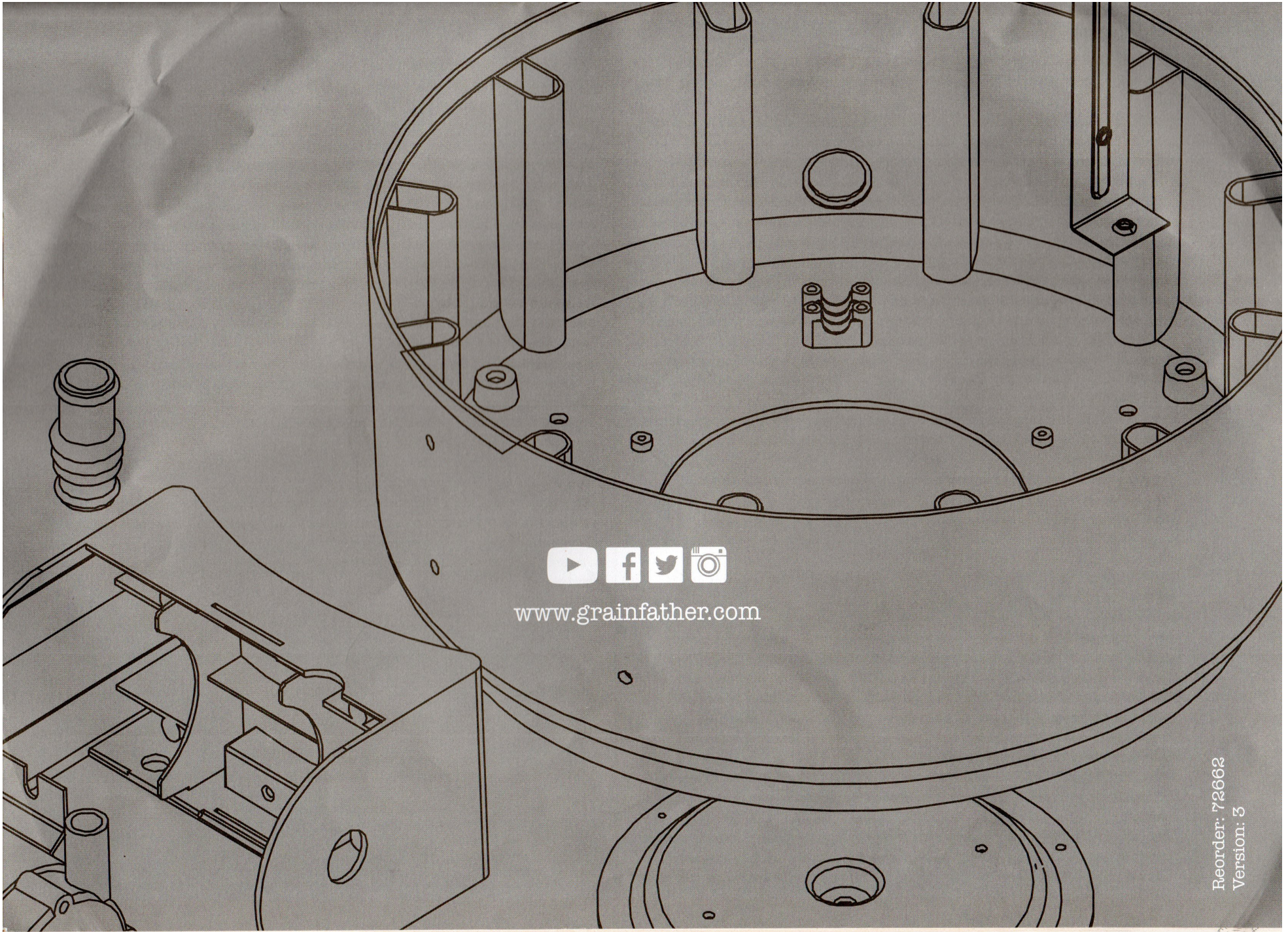
LEGALITY

It is legal in most countries to brew your own beer at home, however it is illegal to sell any alcohol without a valid liquor license. Please drink responsibly and do not give alcohol to minors.

GUARANTEE CONDITIONS

- Statutory guarantee conditions apply. The guarantee period is 24 months from the date of purchase.
- A valid purchase receipt will need to be presented for any guarantee claims.
- No guarantee will be given for any defects due to non-compliance of the operating instructions, improper handling and/or treatment of the unit.
- Guarantee claims are excluded where any work has been performed on the unit by unauthorised parties.

Should your product display any defects in the guarantee period, please contact us. For guarantee claims return the product to the dealer/agent of purchase.



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