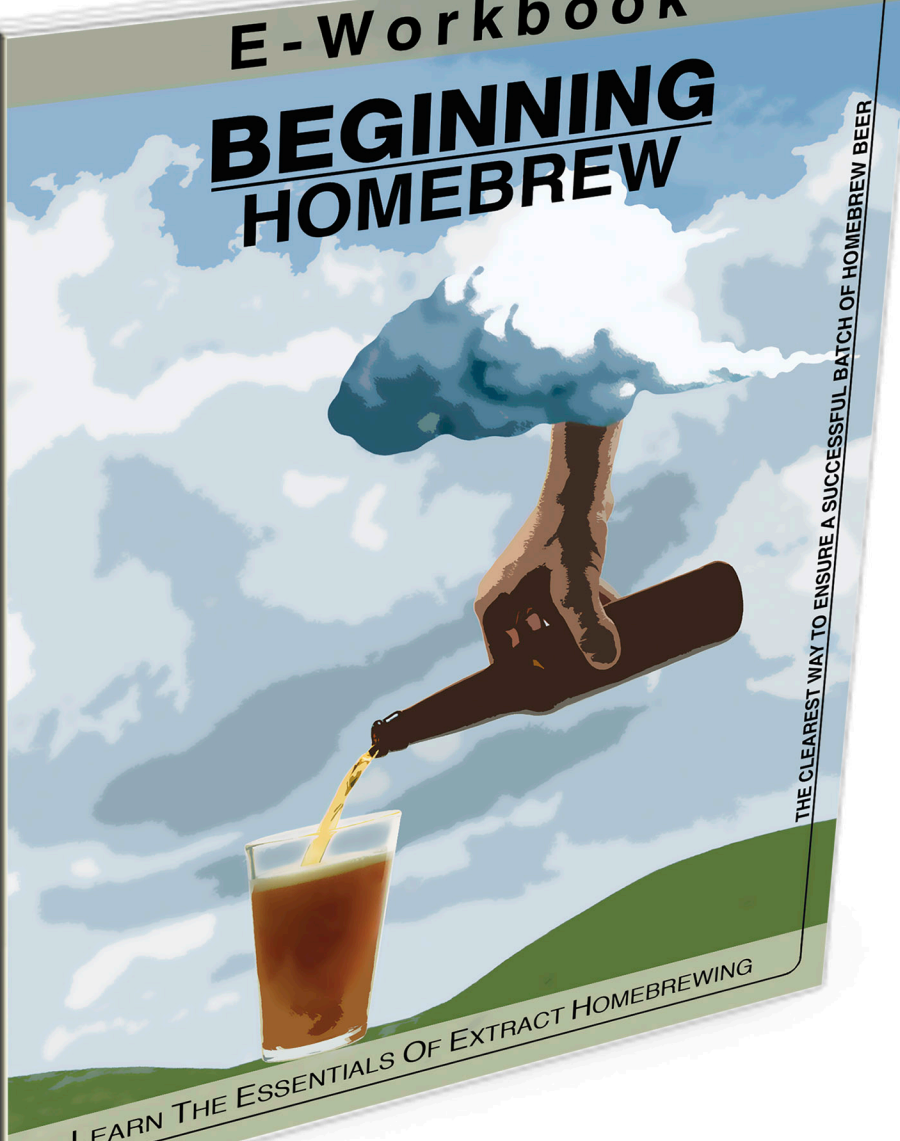


E-Workbook

# **BEGINNING HOMEBREW**



THE CLAREST WAY TO ENSURE A SUCCESSFUL BATCH OF HOMEBREW BEER

LEARN THE ESSENTIALS OF EXTRACT HOMEBREWING

This e-book is NOT a stand-alone product.

This e-book IS an accompanying guide to the Beginning Homebrew DVD. The video has the great advantage of visually showing every step of the homebrewing process. The e-book serves to add additional information that is often hard to fit into a concise video. The e-book and the video combined will give you the best resource to start homebrewing beer.

If you'd like more information on the Beginning Homebrew DVD check out the website at: [www.beginninghomebrew.com](http://www.beginninghomebrew.com)



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# Phase 1

This first day is mostly about the initial boil. Any equipment that will come in contact with the wort after the boil will need to be sanitized first.

**\*Need to be Sanitized**

## The Equipment

- Main boiling pot
  - At least 16-quart
  - Stainless steel or enamel
  - No aluminum
- 3-quart pot for specialty grains
- \*Plastic primary fermentation bucket (food grade HDPE)
- \*Airlock. No rubber stopper is needed when you're using the plastic primary fermenter.
- \*Thermometer
- Measuring cups and spoons
- Large cooking spoon. Avoid wooden spoons; use plastic or stainless steel.
- Non-abrasive sponge and soap (for general cleaning)
- Sanitizing agents for making sanitation solution
- Cheesecloth or strainer

## The Homebrew Specific Shopping List

- Specialty grains
- Malt extract (*can, powder, or bulk syrup*)
- Hops (*recipe dependent*)
- Gypsum salts (*To adjust water pH - depending on the water sources*)
- Calcium carbonate (*To adjust water pH - depending on water sources*)
- Calcium chloride (*To adjust water pH - depending on the water sources*)
- Irish moss
- Yeast
- 2 gallons of chilled water (*Bottled water or previously boiled*)

## Optional

- If your specialty grains come uncrushed:
  - Rolling pin
  - Gallon-sized zip lock bag
- If you are boiling all 5 gallons at once: \*Wort chiller
- If you don't have an icemaker: extra ice
- If you are keeping track of alcohol density:
  - Hydrometer
  - \*Turkey baster (new and dedicated to sampling beer only)
- If you are using whole leaf hops: \*Strainer
- If you are using malt extract from a can: Can opener



# 1 Getting Started

Homebrewing is very enjoyable and also a lot easier than most people think. There are lots of different ways to homebrew. Learn from a variety of sources and you can eventually develop a method that works specifically for your needs.

A lot of how you brew will depend on:

- Budget
- Kitchen space
- Time
- Interest level

Beginning Homebrewers usually start by learning how to brew an ale-style beer. With an ale-style beer there is no need for the extra refrigeration that is used for making lager beers.

Remember that the key to making great beer is proper sanitation.

## 2 The Wort

The first step in making beer is to make the wort. Wort is the sugar-containing liquid also known as unfermented beer. Adding malt extract and hops to boiling water makes wort. The standard size for a batch of beer is 5 gallons. You'll find most recipes are for 5-gallon batches.

The main components of wort are:

- **Water**
- **Malt extract**
- **Hops**

Sometimes additional specialty grains

**Yeast** is added to the wort.

After a week or two the yeast will consume the sugar to produce alcohol. After the sugars have been converted to alcohol the wort is considered beer.



# 3 Specialty Grains

The four main ingredients of beer are:

- Malt
- Hops
- Yeast
- Water

Specialty grains are essentially the 5th ingredient. There are different types of grains and they vary by roasting time. Darker grains will have been roasted longer. The grains are usually malted barley, but can also include other malted grains.

Specialty grains can come crushed or uncrushed. Uncrushed specialty grains will last longer and you can crush them yourself. To crush them, place the grains in a gallon-size freezer bag and use a rolling pin.

You can put them in a cheesecloth bag before steeping to keep everything clean.

If you don't have the cheesecloth but do have a strainer, you can put the grains in the pot directly. After the grains have steeped you will then strain the liquid as it is added to the main boiling pot.

## Process

- Bring 3 quarts of water to 160°F
- Add the grains (will be determined by your recipe)
- Steep for 45 min (will vary depending on the recipe)
- Remove the grains
- Add the liquid to the main boiling pot

*This step can be started at the same time as you bring your main boiling pot to a boil. The 3 or 5 gallons used in the main pot (see below) will take a bit of time to come to a boil. The advantage of keeping them separate is you can turn up the heat on the main pot and not worry that you are overcooking the specialty grains. The three quarts used for steeping the specialty grains will also compensate for water lost to evaporation during an hour-long boil of the main pot. This keeps your final amount after your boil close to 5 gallons.*



# 4 The Boiling Pot

The source of water for homebrewing is a very important component in beer. For the Beginning Homebrewer the most important things to be aware of in terms of water are:

- Hardness
- Chlorine content

These water elements vary depending on where you live. To help create a level of consistency you can use carbon filtered or bottled water.

Sometimes additional adjustments to the water can be made. Adding water salts and other compounds can make these adjustments. This is a greater concern for the advanced homebrewer.

There are 2 main options when selecting a pot for the main boil to create a 5 gallon batch of beer.

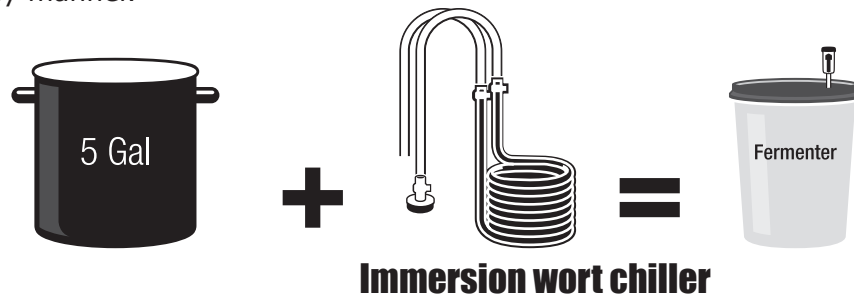
## Option 1:

The method shown will consist of boiling 3 gallons of water in the main pot. 2 gallons of chilled water will then be added to create the full 5 gallons in the fermenter.



## Option 2:

Alternatively you can boil all 5 gallons at once in a bigger pot. Since no extra cold water is added in this method, an immersion wort chiller is needed to cool the wort in a timely manner.



## Process

- Start the main boil
- Add the specialty grain solution

*Make sure to check out the additional section on the DVD for cooling a 5-gallon pot if you have chosen option 2.*



# 5 Malt Extract

Using malt extracts is the easiest way to get started in homebrewing. Malt extract is a concentrated syrup or powder made from malted barley. The extract will provide the sugars that the yeast will ferment. Malt extracts come in different forms.

- Cans (often 3.3 or 6.6 lb)
- Powder or Dry Malt Extract (DME)
- Bulk syrup (measured out at your local homebrew supply shop by weight)

If you are using a syrup extract, note that it will pour more easily if warmed. You can start this as you are waiting to bring your main pot to a boil and/or steeping the specialty grains.

When adding the malt extract, make sure to shut off the heat, add the extract slowly, and stir frequently. This will prevent boil-over of your brew pot and potentially a large mess.

## Process

- Turn the stove off
- Slowly add the malt extract
- Bring back to a boil

*Wiki link*

[http://en.wikipedia.org/wiki/Malted\\_barley](http://en.wikipedia.org/wiki/Malted_barley)



# 6 Adding Hops

The two most common forms of hops used in homebrewing are

- Whole leaf hops
- Pellets

Hops differ in their variety and in the region they are grown in. Different hops will give beer different flavors. The amount of time boiled will also affect how much of the hops flavors are incorporated into the beer. Your recipe will give you specific instructions on how to add hops.

Different recipes will call for the addition of hops all at once, or on an addition schedule.

An example of an addition schedule follows:

- Add 1.5 oz hops type 1 at the beginning of the boil (boil for 60 min)
- Add .5 oz hops type 2 after 40 min of the boil (boil for 20 min)
- Add 1 oz hops type 3 at the end of your boil (finishing hops)

In addition to hops, other ingredients can be added during the boil. Water salts can also be added as needed. Irish moss will help clarify your beer by precipitating proteins in the wort. Irish moss, which is actually seaweed, comes dehydrated and is added during the boil.

## Process

- Add Hops
- Add gypsum salts
- Add Irish moss



## 7 Cooling The Wort

Having boiled the wort for about an hour, depending on the recipe, you'll have to cool the wort. The more quickly you cool the wort the better. You won't want the wort to sit for hours cooling, because the longer the wort sits the greater the chance of contamination.

In order to cool the wort quickly, the 16-qt pot will be immersed in an ice bath. Have plenty of ice on hand. The wort should cool for about 30 minutes with frequent changes of ice. The wort will have to be cool enough that when the additional 2 gallons of refrigerated cold water are added the final temperature will not be greater than 75°F.

## 8 The Wort Chiller

An immersion wort chiller is needed if you are boiling all 5 gallons of wort. Cold tap water is run through copper coils, which draw heat from the wort. A wort chiller cools the wort in 15-30 minutes, depending on the temperature of the tap water.

Your wort chiller needs to be sanitized before it is added to the hot wort. You can do this by placing the wort chiller in a no-rinse sanitation solution. Alternatively, you can place it directly into the boiling pot for the last 20 minutes of the boil.



# 9 Yeast

Yeast is a member of the fungus family. It is a single-celled organism responsible for the fermentation of beer.

Yeast loves to eat the sugars in the wort. When it does so, it converts the sugars to carbon dioxide and ethanol (alcohol) as byproducts. There are many different ale yeast strains to choose from. Most recipes will come with a yeast strain recommendation.

The temperature at which you store your fermenting beer can have an impact on how well the yeast works.

Yeast used to make ales will come either dehydrated or in its hydrated form. These can be the same yeast strain, only processed and packaged differently.

Some of the advantages and disadvantages to each are:

## Dehydrated

Advantages:

- Less expensive
- Longer shelf life
- No special storage requirements



Disadvantages:

- Needs hydration
- Greater chance of contamination

## Hydrated

Advantages:

- Ready to use
- Less chance of contamination



Disadvantages:

- More expensive
- Shorter shelf life

*Ales and lagers are brewed with different yeast strains. Ales are brewed with top fermenting yeast while lagers are brewed with bottom fermenting brewers yeast.*

*More about yeast*

*<http://en.wikipedia.org/wiki/Yeast>*

*<http://en.wikipedia.org/wiki/Ale>*

*<http://en.wikipedia.org/wiki/Lager>*



# 10 Hydrating Yeast

Boil 1.5 cups of water for about 5 minutes and let it cool to 100°F. Add the dehydrated yeast without stirring, and set aside for about 15-30 minutes before pitching. This can also be started as you are waiting for your wort to chill.

Keep everything clean and sanitary.

## Process

- Boil 1.5 cups of water
- Let the water cool to 100°F
- Add the yeast

*For the activator packet yeast, follow the manufacturer's instructions.*



# 11 Adding Wort To The Fermenter

Once the wort has cooled and the yeast has been prepared, it is time to add the elements to the primary fermenter. First add the two gallons of cold water to the primary fermenter. Then add the wort. It is preferably added with a vigorous pour, which helps add oxygen to the mixture. At this stage some recipes will call for straining with a sanitized strainer.

Having added warm wort to cold water, the mixture should be at around 75°F. This should be verified with a thermometer. - If you are taking hydrometer readings, remember to also note the temperature, as liquid density is temperature-dependent. Add the yeast. Seal the fermenter.

## Process

- Add the 2 gallons of water to the primary fermenter
- Add the wort to the primary fermenter. Use a sanitized strainer if necessary
- Make sure the temperature of the wort is not greater than 75°F
- Take a hydrometer reading if desired
- Pitch the yeast
- Seal the fermenter and add the airlock

*Some Homebrewers prefer to agitate the wort once it is sealed in the primary fermenter. The process of agitating adds oxygen to the beer to encourage yeast growth. If you are using a glass carboy as the primary fermenter, or if you poured your wort slowly, be sure to agitate your beer.*



# 12 Storing The Fermenter

When storing your fermenter, find a place out of the way where it will not be disturbed. The fermenter should be at about room temperature. You can cover the fermenter with a blanket to keep the temperature more constant. It is especially important to keep a glass carboy fermenter covered or in a dark place away from sunlight.

Primary fermentation should take about 3-7 days, depending on the recipe, temperature and yeast used.



# Phase 2

Phase 2 involves clarifying the beer and can be started between 3 to 7 days after the first day.

**\*Need to be Sanitized**

## The Equipment

- \*Auto-siphon and tube
- \*Glass carboy
- \*Airlock and stopper
- Non-abrasive sponge and soap (for general cleaning)
- Sanitizing agents

## Optional

- If you are keeping track of alcohol density:
  - Hydrometer
  - \*Turkey baster (new and dedicated to sampling beer only)



# 13 Racking The Beer

Some beginners are taught to skip secondary fermentation and bottle directly from the primary fermenter. Racking beer and secondary fermentation are not difficult steps, and by doing them you can make a much better beer.

While it was good to agitate the beer when starting fermentation, at this stage it will be important not to agitate the beer. It is also very important to make sure that everything that comes in contact with the beer has been sanitized. Be careful not to pick up any of the sediment layer at the bottom of the bucket. Put on the air lock and place the beer back in a safe place for additional fermentation.

## Process

- Sanitize secondary fermenter
- Siphon beer into secondary fermenter
- Take hydrometer reading, noting the temperature
- Add stopper and airlock

*Why a hydrometer reading at this stage?*

*To measure alcohol content you just need a reading from the beginning batch and the end batch before bottling. A hydrometer reading when racking your beer will let you know how much of the sugars have been converted to alcohol up to that point. A hydrometer reading can be used to determine if any adjustments need to be made for temperature during secondary fermentation, and how close to bottling the batch of beer is.*



# Phase 3

Phase 3 is the last phase in making the beer. It will end with bottling. Followed of course enjoying your homebrew.

**\*Need to be Sanitized**

## The Equipment

- \*Plastic primary fermentation bucket (food grade HDPE)
- \*Thermometer
- Measuring cups and spoons
- Auto-siphon and tube
- \*Bottling wand which makes bottling very easy
- Bottle cap crimper
- Non-abrasive sponge and soap (for general cleaning)
- Sanitizing agents for making sanitation solution

## The Homebrew Specific Shopping List

- \*Clean, empty bottles
- \*New bottle caps
- Dextrose or brewer's sugar (corn sugar)

## Optional

- If your aren't diligent about cleaning your bottles immediately after drinking:
  - Bottle washer
  - Bottle brush
- If you are keeping track of alcohol density:
  - Hydrometer
  - \*Turkey baster (new and dedicated to sampling beer only)
- If your kitchen is well-equipped
  - Dishwasher to clean your bottles



## 14 Selecting The Bottles

Homebrewers have a few choices when obtaining bottles for their beer. They can buy new bottles from a homebrew supply store. Most homebrewers, though, will just use empty beer bottles from other beers they have drunk. If you are going to save bottles, make sure to rinse them out immediately after finishing them. This will prevent any mold growth inside the bottles.

When saving bottles, make sure that they are crowned bottles and not twist-off. Twist-off bottles cannot be recapped, and aren't useful in homebrewing.

Removing the labels is not necessary. But if you feel the need to remove the labels, it can be done fairly easily. Soak them for 30 minutes and then use a stiff brush to scrub the labels right off.

It's best to use bottles that are amber or green in color. This is to prevent light from affecting the beer. Avoid using clear glass bottles.

## 15 Sanitizing The Bottles

Before the bottles can be filled with beer they must be sanitized. There are several ways to do this. One method is to create a sanitation bath with a no-rinse sanitizing agent. Dunk the bottles in the sanitation solution and swirl them around.

You can also prepare the bottles by using a dishwasher. The beer bottles must be clean before they are added to the dishwasher. While technically not a sanitizer, a dishwasher can wash and heat the bottles well enough for bottling, assuming you have a properly functioning dishwasher and have used the high heat settings. Don't use jet dry type solutions, as they can leave an undesired residue on the bottles. Keep the dishwasher closed until you are ready to bottle.



# 16 Priming Sugar

In order for the beer to carbonate in the bottles, you need to give the beer a final bit of sugar. The remaining yeast in the beer will eat up this sugar and produce just enough carbon dioxide to carbonate the beer.

## Process

- Bring about 2 cups of water to a boil
- Add  $\frac{3}{4}$  cup of dextrose (corn sugar)
- Boil for about 5 min
- Let it cool



# 17 Adding Beer To The Bottles

Before bottling gather:

- The fermenting beer
- Priming sugar solution
- A Sanitized bucket (This bucket can be your primary fermenter or an other food grade bucket)
- Sanitized bottle caps. Either boiled or sanitized with sanitation solution.

Add the primary sugar solution to the bucket. Siphon the beer into the bucket. This will mix up the sugar solution and properly mix both.

Assemble the siphon and bottling wand. Without a wand you would need to guage each beer to allow enough headroom for the beer. 1 to 1 ½ inches should do it. But a wand is a simple device that make bottling very easy.

Place a cap on. You can crimp the bottles all at once. Letting them sit for 15 min or so will let some of the co2 displace some oxygen in the bottles. Not necessarily a crucial step. If you have an extra hand you can simply crimp as they are filled and capped.

## Process

- Add the priming solution to the bucket, making sure it has mixed well with the beer
- Siphon the beer into the bucket
- Make sure the sugar is evenly distributed in the beer



# 18 Crimping and Storing

Crimp the bottles and store them for about 3 weeks. This will give the beer enough time to carbonate.

A recap on how simple it is to make beer:

- Make the wort
- Chill the wort
- Pitch the yeast to the wort
- Allow fermentation to occur
- Bottle the beer
- Store the beer for three weeks



# Appendix 1- Sanitizing

Sanitation is important in making good homebrew. Wort is essentially a big batch of sugar water. Microorganisms such as bacteria and wild yeast love to grow in wort. The yeast you'll be adding to the wort is technically a specific strain of fungus with predictable taste and reaction. You want your ale yeast to thrive in the wort, but you don't want anything else that could grow to get in the way. This is why it is crucial that homebrew beer not be contaminated with other microorganisms.

## Clean vs. Sanitary

It's important to make the distinction between being clean and being sanitary. Cleaning something uses soap and water to remove dirt, oils, and debris. When you sanitize, you are killing the invisible microorganisms on the equipment. It is possible to have one or the other, but in homebrewing it is very important to have both together.

Be sure to use non-abrasive sponges on plastics such as your primary fermentation bucket. Scratches can lead to potential hiding spots for bacteria.

Common cleaners, which remove dirt, oils, and debris, are:

- Soaps and detergents
- TSP

Common sanitizing agents, which kill microorganisms, are:

- Chlorine (household bleach)
- San star
- Iodaphor -(iodine-based sanitizers)
- Percarbonates

*Contaminated or "bad" beer won't hurt you. There aren't any pathogens in bad beer. A ruined batch of homebrew just doesn't taste good. You'll also lose your hard work, time, and money from a bad batch.*



# Appendix 2- Hydrometer

A hydrometer is a long cylindrical glass device used to determine the density of liquids. This is useful to homebrewers because a hydrometer can help determine the alcohol content as well as help gauge when fermentation has stopped.

Specific gravity is the measurement of a liquid's density. Water has a specific gravity of 1.000 at 60°F.

As sugar (in the homebrewers' case, malt) is added to water, it increases the specific gravity. As yeast consumes the sugars it lowers the density, both because there is less sugar and because alcohol has a lower density than water. Taking a reading at the start of fermentation and at the end will give you an idea of how much of the sugar has been converted to alcohol. In this way you can make an estimate of alcohol content.

The hydrometer readings are temperature dependent. Adjustments will need to be made if the temperature varies greatly from readings.

The following is an example of how hydrometer readings can be used to determine alcohol content:

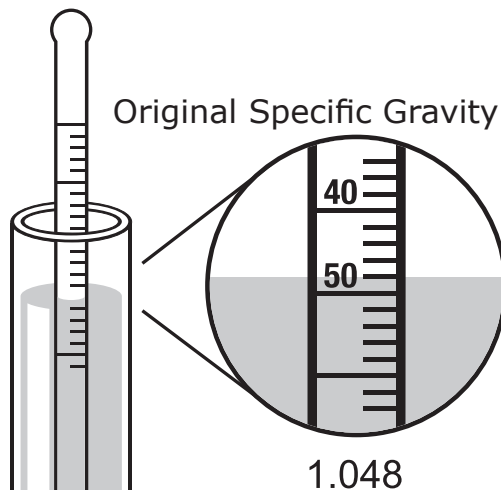
Adding 6lbs of malt to 5 gallons gives your initial wort a specific gravity of  
1.048 (at 60°F) = OG

When you rack your beer the specific gravity is  
1.021 (at 60°F)

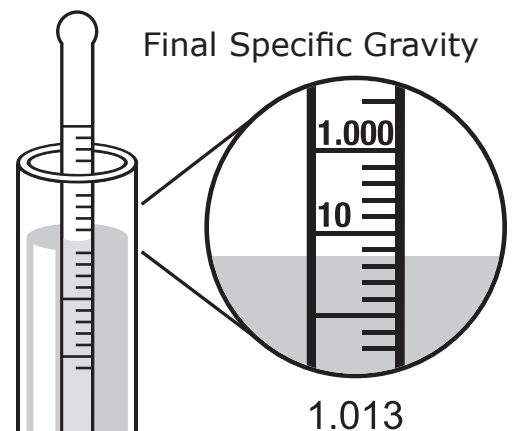
At the end of fermentation the specific gravity is  
1.013 (at 60°F) = FG

## Alcohol by Volume - ABV

### First Reading - Day 1



### Final Reading - Bottling Day



(Continue on the next page)



## Appendix 2- Hydrometer Continued

Original Specific Gravity  
Taken from the wort the first day.  
1.048

Final Specific Gravity  
Taken from the beer during bottling  
day.  
1.013

The way to calculate alcohol by volume is plugging in the original gravity and the terminal gravity into the following equation.

$$\% \text{ Alcohol} = ((1.05 \times (\text{OG} - \text{TG})) / \text{TG}) / 0.79 \times 100\%$$

While this equation is a bit complicated, there are a few simpler tricks in calculating alcohol content.

One simple trick involves getting the difference from the beginning and end hydrometer readings, then multiplying the result by 131.

$$1.048 - 1.013 = .0035 \times 131 = 4.585 \text{ or roughly } 4.6\% \text{ ABV}$$

After taking a hydrometer reading, never add your sample of beer or wort back to the larger container. Taste it or toss it.

*Many Beginning Homebrewers become intimidated by hydrometer readings. This should not deter a beginner from making homebrew. Hydrometer readings are by no means necessary to making a good batch of beer. As you become more experienced in homebrewing, hydrometer readings will become more important.*

*Links*

*<http://en.wikipedia.org/wiki/Hydrometer>*