



May all your fermentations be Great Fermentations!

Quadratic Equation — Our Brewer's Reserve Oaked Belgian Quad!

Mathematical! This Belgian Quad may have a clever, mathematically-derived name, but the results of brewing this beer are real and tangible, even to those unfamiliar with the famed equation. A huge quad that gets better with age, the included oak gives it a barrel-aged flavor!

BEER SPECS

Original Gravity: 1.089—1.093

Final Gravity: 1.021—1.024

IBU: 28-32

ABV%: 8.5% - 9.5%

Yield: 5 Gallons

NOT INCLUDED IN KIT

Irish Moss (*for clarity, optional*)

0.5 lbs Light Brown Sugar

Yeast

Bottle Caps (*53 caps needed*)

Priming Sugar (*5oz or 3/4 cup*)

USEFUL INFORMATION

Wort = unfermented beer

First wort hops = hops added before bringing wort to a boil

Rack = to transfer from one vessel to another

Pitch = to add yeast to the fermenter

OG = Original Gravity: Specific Gravity Before Fermentation

FG = Final Gravity: Specific Gravity After Fermentation

ABV = Alcohol by Volume

ABW = Alcohol by Weight

IBU = International Bittering Units

Alcohol by Volume Equation:

$\%ABW = (OG - FG) \times 105$

$\%ABV = ABW \times 1.25$

RECIPE DETAILS

9.0 lbs. Light dried malt extract

3.3 lbs. Munich Liquid malt extract

1.0 lbs. D-90 Belgian Candi Syrup

0.5 lbs. Light Brown Sugar (*not included*)

1.0 lb. Caramunich Malt

1.0 lb. White Wheat Malt

0.5 lb. Special B Malt

1.0 oz. Norther Brewer hops, added at the beginning of the 60 min boil

0.5 oz. Spalt hops, added 20 min from the end of the boil

1.0 tsp. Irish moss (*optional*), added 20 min from the end of the boil

1 lb. D-90 Candi Syrup, added at the last 10 minutes of the boil

0.5 lbs. Light Brown Sugar (*not Included*), added at the last 10 minutes of the boil

0.5 oz. Spalt hops, added 5 min from the end of the boil

1.0 oz. French Oak Cubes, Heavy Toast, added after primary fermentation is complete, or in the secondary fermenter.

YEAST SUGGESTIONS: Wyeast #1214 Belgian Abbey Ale, Wyeast #1762 Belgian Abbey Ale II, Imperial Organic Yeast B45 Gnome or Abbaye Dry Yeast.

Three to four standard packs of yeast or a 2L starter are highly recommended.

EQUIPMENT

REQUIRED EQUIPMENT

- 3 gal or larger Brew Pot
- 6.5 gal Primary Fermenter
- Siphon Hose/Racking Cane
- Large Spoon or Paddle
- Air Lock
- Hydrometer
- Thermometer
- Cleanser
- Sanitizer
- Bottles or Kegging System

RECOMMENDED EQUIPMENT

- 7.5 gal Brew Pot
- Wort Chiller
- 5 gal Secondary Fermenter
- Thief
- Oxygen Cylinder
- Aeration Stone
- Auto Siphon



Brewing Instructions:

Quadratic Equation

PRIOR TO BREWING

1. **Clean and Sanitize** all equipment, tubing, etc.
2. If using White Labs liquid yeast, remove package(s) from fridge and let warm for 4-8 hours at room temperature. If using a Wyeast Activator pack, remove package(s) from fridge, 'smack' the pack to release the nutrients and allow the pack to swell for 4-8 hours at room temperature. If making a starter, prepare it 1 to 3 days before pitching.

BREWING DAY

1. Fill kettle with water and heat to 160F.
 - Partial boil method: fill kettle with as much water as possible while leaving room for grains, malt extract, and boil volume.
 - Full boil method: fill kettle to approximately 6.5 gal water for a volume of 5 gal post-boil.
2. Rehydrate Irish moss in 1/2 cup warm water. Set aside (*optional, for clarity*).
3. Turn off burner (remove kettle from heating element if using an electric stove). Place crushed specialty grains in a muslin bag and soak in **150-155F water for 30 minutes**. Remove bag, and allow remaining water in grains to drain into kettle. Do not squeeze the grains.
4. Add malt extracts while stirring until fully dissolved.
5. Turn the heat on and bring wort to a boil. **WATCH OUT!** Just before the boil, the wort rapidly rises.
6. Follow **Boil Schedule** on opposite page under 'Recipe Details'
7. At end of boil, chill wort as quickly as possible to **60-70F** with a wort chiller or an ice bath. Place lid on kettle while chilling.
8. Siphon or pour cooled wort into fermenter leaving as much sediment behind as possible:
 - Partial Boil: Add sterile water (packaged drinking water) to fermenter to reach 5.25 gal
 - Full Boil: Siphon entire volume of wort into fermenter.
9. **Aerate wort** well by stirring, shaking or oxygenating.
10. Sanitize yeast package and use sanitized scissors to open package. Pitch yeast and attach airlock. If using a yeast starter, pitch entire contents of yeast starter into wort.
11. Move fermenter to a dark place with a steady temperature of **64-72F**.

FERMENTATION

1. Primary Fermentation: Allow beer to ferment for 14-21 days, then proceed to STEP 2 or 3.
2. Secondary Fermentation (*optional*): Transfer beer to a 5 gal carboy, leaving behind the sediment, then proceed to STEP 3.
3. Add **1 oz oak cubes** to carboy and leave in contact with beer from 2 to 6 weeks or until desired oak character is achieved.
4. Check gravity prior to proceeding with bottling to ensure fermentation is complete. (Reference *Final Gravity* under 'Recipe Details')

BOTTLING

1. Ensure there is no bubbling in the airlock, and that your beer has reached final gravity.
2. **Clean and sanitize** all bottles, caps, bottling equipment and bottling bucket.
3. Dissolve **3/4 cup (5 oz) priming sugar** in 2 cups boiling water. Boil for 5 min then chill to 70-80F and add to bottling bucket.
4. Siphon beer from fermenter into bottling bucket, being careful not to rouse up sediment on bottom of fermenter.
5. Stir thoroughly but gently to avoid introducing oxygen.
6. Using the bottle filler, fill bottles and cap them.
7. Store bottles at room temperature for **2 weeks** or until carbonated

TIPS FOR SUCCESS

1. Clean AND Sanitize!
2. Avoid using softened water or Reverse Osmosis water.
3. Make sure the specialty grains are loose inside the muslin bag to ensure water reaches the grain in the middle of the bag.
4. Tie muslin bag to handle of kettle to prevent potential scorching on bottom of kettle.
5. Be sure not to exceed 155F while steeping grains to avoid unwanted flavors.
6. Turn off heat source and stir well while adding malt extract to avoid scorching on the bottom of the kettle.
7. Keep a spray bottle of water at hand to spray top of wort if it nears a boil over.
8. While racking, be sure not to introduce oxygen into your beer by splashing or shaking.
9. Maintain a constant temperature during fermentation.
10. Elevate carboy a few days before racking to allow sediment to settle.
11. Visit www.greatfermentations.com for more brewing tips and tricks.

