

# Parti-gyle Brewing

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# What is parti-gyle brewing and why do we do it?

Parti-gyle brewing is an ancient technique where a single batch of grain (mash) is used to produce two or more beers of varying strengths by collecting separate "runnings" of wort.

- Have you ever made a high gravity beer such as Barleywine, Russian Imperial Stout, Weizenbock etc.?
- Do you know how much sugar is left in the grains after collecting these high gravity worts?
- Why don't we take advantage of the remaining sugars? It's potentially another 'free' batch of beer.

# Historical Timeline

- **Medieval Origins:** The method dates back to medieval times, particularly in England and Belgium. It was the standard practice for centuries because breweries often had massive mash tuns but lacked equally large boiling kettles.
- **1700s–1800s:** This was the peak era for parti-gyle brewing. Breweries in the UK and Scotland commonly produced three distinct tiers from one mash:
  1. **Strong Beer:** From the first, high-gravity runnings (e.g., Barleywine or Strong Ale).
  2. **Common Beer:** From the second runnings (e.g., Bitter or Best Bitter).
  3. **Small Beer:** From the third runnings, resulting in a weak, low-alcohol beer for everyday consumption.
- **The Shift to "Entire" Brewing (c. 1725):** Around 1725, a new method called "entire" brewing emerged, where all runnings were mixed into a single vessel to create one beer of consistent strength. This eventually became the modern standard.
- **Late 20th Century to Present:** While rare in large-scale commercial brewing today, the technique remains a hallmark of a few traditional breweries and is popular among homebrewers.

# Traditional Beer Styles

Several historical and modern beer styles originated from or were influenced by the parti-gyle system:

- **English Bitters:** [Fuller's Brewery](#) in London is famous for still using a modified parti-gyle system to produce London Pride, ESB, and Chiswick Bitter by blending different runnings.
- **Trappist Ales:** The Belgian naming convention of **Tripel** (first runnings), **Dubbel** (second runnings), and **Single/Enkel** (third runnings) is historically rooted in this method.
- **Barleywine & Small Beer:** A classic pairing where the first thick runnings make a potent Barleywine and the remaining sugars produce a light Small Beer.

# The "X" Labeling System

In old English breweries, barrels were marked with "X" symbols to denote strength based on which part of the gyle they came from.

- **XXX:** Strongest (first runnings).
- **XX:** Common (second runnings).
- **X:** Small beer (third runnings).

# Examples of Breweries Using Parti-Gyle

- [Fuller's Brewery \(UK\)](#): The most famous practitioner, known for using the strong first runnings for beers like their Barley Wine and the weaker second runnings for ales like London Pride, though their modern approach combines tradition with contemporary equipment.
- [Noble Beast Brewing Co. \(USA\)](#): Created an English-style nitro ale by using the second runnings from their strong WDR Barleywine to brew a smaller bitter, highlighting efficiency and flavor.
- [Happenstance Brewing Project \(USA\)](#): Collaborated on brews using parti-gyle to produce both a Spruce IPA (first runnings) and a Pale Honey Spruce Ale (second runnings) from the same mash.
- [Black Flannel Brewing & Distilling Company \(USA\)](#): Uses parti-gyle inspired methods for their grain-based spirits (whiskey/genever) and beers, showcasing versatility.
- [Burnt Timber Brewery \(USA\)](#): Offers side-by-side tastings of high-octane first runnings (like their Double Shimmy IPA) and weaker second runnings (like their White Ale).

# Why Breweries Use It

- **Efficiency:** Maximizes sugar extraction from the grain, reducing waste.
- **Flavor Complexity:** Produces vastly different beers (strong vs. weak) from one grain bill, offering unique flavor profiles.
- **Tradition & Novelty:** Appeals to brewers and drinkers seeking historical methods and unique, handcrafted beers.

# Common Combinations for High & Low ABV Beer

Higher ABV Beer- American Barleywine

Lower ABV Beer- American Pale Ale

Higher ABV Beer- English Barelywine

Lower ABV Beer- English

Higher ABV Beer- Imperial Stout

Lower ABV Beer- Dry Irish Stout

Higher ABV Beer- Doppelbock

Lower ABV Beer- Munich Dunkel

Higher ABV Beer- Weizenbock

Lower ABV Beer- Dunkles Weissbier

Higher ABV Beer- Belgian Tripel

Lower ABV Beer- Belgian Pale

Higher ABV Beer- Old Ale

Lower ABV Beer- Dark Mild

Higher ABV Beer-Eisbock

Lower ABV Beer- Helles Bock

# Process / Equipment

- You technically don't need any additional equipment except an extra fermenter
- Even for all-in-one (AIO) users:
  - Mash, pull basket, boil, drain, refill with more water, heat water, re-add the basket
  - Note however that this is a LONG brew day, and high gravity is typically difficult on AIOs to begin with
- Extra equipment will speed up your brew day because you can do more in parallel
- A 3-vessel system with dual-heater is ideal to allow you to start the boil on the first runnings while heating/sparging the 2nd runnings
- Everyone's system is different. Figure out what works for you.

# Specific Gravity Considerations

- Collecting high gravity wort is more difficult than collecting low gravity wort
  - As the wort gets saturated with sugars, it gets harder to extract from the grains
- Efficiency plays a huge role in determining the gravity of the 1st and 2nd runnings
- Mash efficiency is its own complex topic that is dependant on many factors
- For this discussion, let's just note that efficiency drops when collecting high gravity wort
- If your normal brewhouse efficiency is 75%, assume your first runnings will drop to 50% efficiency for high gravity
- Blending and/or diluting the different runnings is very common to hit your targets

# Specific Gravity Calculations

- Think in terms of gravity points. Consider:
  - Points per pound per gallon (ppg) of grain that you're using, or for simplicity, assume 35 ppg
  - Extract potential and your brewhouse efficiency
- Points per pound per gallon (ppg) review
  - Specific gravity can be represented in points. 1.040 = 40 points, 1.110 = 110 points.
  - Based on 'Fine Grind Dry Basis' (FGDB) laboratory extract, which represents the maximum theoretical extract, not a realistic brewhouse outcome
  - Points = weight of grain (lb) \* ppg of grain / water volume (gallons)
  - 35 ppg means 1 pound of grain will add 35 points to 1 gallon of water.  $1 \text{ lb} * 35 \text{ ppg} / 1 \text{ gallon} = 35 \text{ points}$
  - If you double the grain, you double the points for the same volume of water
    - 2 lbs of grain in 1 gallon of water =  $2 \text{ lbs} * 35 \text{ ppg} / 1 \text{ gallon} = 70 \text{ points}$
  - If you double the water, you dilute the points by the dilution factor
    - 1 lbs of grain in 2 gallons of water =  $1 \text{ lbs} * 35 \text{ ppg} / 2 \text{ gallons} = 17.5 \text{ points}$

# Recipe Design (Alex's Method)

- I start by focusing on my goal for the bigger beer
- Fully design the recipe as intended for the big beer
- See what's left over in terms of remaining sugar, and then design the smaller beer based on what's left

# Recipe Design Example (Alex's Method)

- Goal: Russian Imperial Stout (RIS) + Irish Dry Stout
- For a 5G batch of RIS, my recipe says to collect 7G @ 1.100
  - $7G @ 1.100 = 7 * 100 = 700$  gravity points that I need to collect
  - Recipe calls for 40 lbs of grain using 50% efficiency
  - Total potential extract of 40 lbs of grain =  $40 \text{ lbs} * 35 \text{ ppg} = 1400$  points
  - With 50% efficiency, we start out by only extracting 700 of the total 1400 points for the RIS
- For the Irish Stout
  - How much extract is remaining? Remember, 35 ppg is the maximum theoretical laboratory extract.
  - Actual remaining extract that we can get out is probably based on ~75% overall efficiency.
  - If we pulled 50% out already, how many points does that remaining 25% give us?
  - $1400 \text{ total possible points} * 0.25 = 350$  points for our Irish Stout
  - For a 7G batch,  $350 \text{ points} / 7G = 1.050 \text{ OG}$  ✓
  - \*\*\*Important\*\*\* you can dilute this for smaller beers, or reduce batch size for bigger beers

# Are you thinking in gravity points yet?

- It's hard to know what your efficiency is going to be for these high gravity beers
- For first runnings, extract your target points, NOT your target gravity at a specific volume.
- It's easier to collect X points, than it is to collect precisely 7 gallons @ 1.100 SG
- Once you extract the desired points, you can just dilute to reach your target gravity and volume
- To do this:
  - Measure gravity as you collect every ½ gallon or so
  - Multiply current volume \* SG measurement to get the total points
  - STOP collecting when you hit total target points
  - Dilute to reach target volume and gravity
- I intentionally underestimate my efficiency so there's headroom for dilution
- Example:
  - Goal is to collect 7 gallons @ 1.100 SG =  $7 * 100 = 700$  points
  - As I collect, I measure gravity at 6G and I see 1.116.  $6G * 116 = 700$  points.
  - STOP collecting from mash. Now dilute with water that I've reached the target points.
  - $6G @ 1.116 = 700$  points. This 700 points becomes 1.100 after dilution.  $700 \text{ points} / 7G = 1.100$

# Extra Considerations

- If you're using extract (\$\$\$) to achieve high gravity worts, this method may not be worth it
- Stick to 1st and 2nd runnings for the homebrew scale
  - 3rd runnings gets into over-extraction territory with pH spiking and extracting excess tannins
- The 2nd batch does NOT need to be a full-size batch
  - Try 5G + 2.5G, or 2.5G + 5G
  - Do you really need 5 gallons of Russian Imperial Stout? (yes, yes I do, thanks for asking)
- You are in for a LONG brew day
  - Most high gravity brews come with long boil times
  - Combine this with back-to-back batches and your brew day just got even longer
  - Two boil kettles is strongly recommended
- Don't be afraid to add more grains to the mash
  - What can you make by adding a little Carafa III? Maibock + international dark lager?
  - What about smoked malt?
- Don't want to 'waste' extra yeast or hops?
  - Put the 2nd runnings outside and make a lambic.
  - Rack onto a yeast cake from a prior beer.