

Targets 5.5% ABV -- 5 Gallons -- 13.5 OG

$$1.055 - x * 131.25 = 5.5\%$$

$$1.055 - x = .0419$$

$$1.013 = x = \text{Target FG} = 3$$

Grain

Two-row Pale - 90%

Caramel | 60°L - 10%

Hops

Amarillo - 4oz

Yeast

Imperial Yeast A07 Flagship - 1 packet

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Calculations

5 gallons x 55 GU = 275 GU of total gravity

Grain Bill

Two-row Pale - $.9 * 275 = 247.5$

Caramel | 60°L - $.1 * 275 = 27.5$

Ingredient gravity/(mash efficiency x maximum extract)

Two-row Pale = 37

Caramel | 60°L = 35

Two-row Pale = $247.5 / (.73 * 37) = \mathbf{9 \text{ lbs}}$

Caramel | 60°L = $27.5 / (.73 * 35) = \mathbf{1 \text{ lbs}}$

Hop Bill

AAU = Weight (oz) x % Alpha Acids (whole number)

IBU = AAU x U x 75 / Vrecipe **(38)**

Amarillo (FWH) $1 * 6.7 * .215 * 75/5 = \mathbf{27}$

Amarillo (10 min) $1 * 6.7 * .114 * 75/5 = \mathbf{11}$

Amarillo (3 min) $1 * 6.7 * .114 * 75/5 = \mathbf{11}$

Amarillo (WP) 4 oz

**Note: Utilization determined based on a full 60 minute boil -*

<http://howtobrew.com/book/section-1/hops/hop-bittering-calculations>

Water Calculations

Strike water volume = weight of grain * desired mash thickness

$$10 * 1.3 = 13 \text{ quarts} = 3.25 \text{ gallons}$$

Sparge water volume = weight of grain * 2

$$10 * 2 = 20 \text{ quarts} = 5 \text{ gallons}$$

Water chemistry targets -

<https://drive.google.com/file/d/1aByjOwJ-V0V7hGjGJgSkQ9erFMjKy8aU/view?usp=sharing>

Efficiency Calculations - TBD

Potential gravity points = (grain gravity points * weight) / volume

Brewhouse efficiency = actual gravity points / potential gravity points

$$37 * 9 \text{ lbs} + 35 * 1 \text{ lb} = 368$$

$$5x = 368$$

$$x = 73.6$$

$$59/73.6 = \mathbf{79\%}$$

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