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

1.055 - x * 131.25 = 5.5% 1.055 - x = .0419 1.013 = x = Target FG = 3

Grain

Two-row Pale - 90% Caramel | 60°L - 10%

Hops

Amarillo - 4oz

Yeast

Imperial Yeast A07 Flagship - 1 packet

Calculations

5 gallons x 55 GU = 275 GU of total gravity

Grain Bill

Two-row Pale -.9 * 275 = 247.5Caramel | $60^{\circ}L - .1 * 275 = 27.5$

Ingredient gravity/(mash efficiency x maximum extract)

Two-row Pale = 37 Caramel | 60°L = 35

Two-row Pale = 247.5/(.73*37) = 9 lbs Caramel | 60°L = 27.5/(.73*35) = 1 lbs

Hop Bill

 $AAU = Weight (oz) \times % Alpha Acids (whole number)$

IBU = AAU x U x 75 / Vrecipe (38) Amarillo (FWH) 1 * 6.7 * .215 * 75/5 = 27 Amarillo (10 min) 1 * 6.7 * .114 * 75/5 = 11 Amarillo (3 min) 1 * 6.7 * .114 * 75/5 = 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 quarts = 3.25 gallons

Sparge water volume = weight of grain * 2 10 * 2 = 20 quarts = 5 gallons

Water chemistry targets -

https://drive.google.com/file/d/1aByjOwJ-V0V7hGjGJqSkQ9erFMjKy8aU/view?usp=sharing

Efficiency Calculations - TBD

Potential gravity points = (grain gravity points * weight) / volume Brewhouse efficiency = actual gravity points / potential gravity points

37 * 9 lbs + 35 * 1 lb = 368

5x = 368 x= 73.6 59/73.6 = **79%**

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