



PCT AMERICAN PALE ALE

FERMENTABLES

- 9 lb 15.8 oz US Pale 2 row
- 1 lb White Wheat Malt
- 11.1 oz Bonlander Munich 10L
- 9.3 oz Carapils
- 7.2 oz Crystal 20L

HOP ADDITIONS

- First Wort: 1 oz Cascade (5.7% AA¹)
(add at lauter)
- 20 min: 0.75 oz Cascade (5.7% AA)
0.75 oz Willamette (5.7% AA)
- 5 min: 1.09 oz Cascade (5.7% AA)
1.09 oz Willamette (5.7% AA)
- Dry hop: 1.74 oz Cascade (5.7% AA)
1.51 oz Willamette (5.7% AA)

YEAST

- WLP 001: California Ale Yeast
Ferment at 64F for 5 days, then ramp up to 72F to finish

ADDITIVES

- Clarifier: 1 tsp Irish Moss **or** 1 tablet Whirlfloc
- Yeast Nutrient: 1/2 tsp White Labs (1/2 tsp/gal Biotin)

Target Statistics ²		Your Results
Orig. Gravity:	1.055	
Final Gravity:	1.012	
Est. % ABV:	5.6%	
Efficiency³:	76.9%	
IBUs:	39	

BJCP Style Guidelines: Am. Pale Ale (1c)

Original Gravity: 1.045 – 1.060 SG

Final Gravity: 1.010 – 1.015 SG

Bitterness: 30 – 50 IBUs

ABV: 4.5 – 6.2%

Overall Impression: A pale, refreshing and hoppy ale, yet with sufficient supporting malt to make the beer balanced and drinkable. The clean hop presence can reflect classic or modern American or New World hop varieties with a wide range of characteristics. An average strength, hop-forward, pale, American craft beer.



Notes:

¹**AA (ALPHA ACID)**: This is the measure of hops' potential bitterness. Be aware when substituting hops with a higher AA% for your "60 min" hop addition, you will increase the bitterness of your beer. "Flame Out" and "Dry Hop" additions will add hoppy aroma but will contribute little bitterness to your beer. Substituting different hops for these later additions will alter the flavor of your beer, but not the level of bitterness.

²**TARGET STATISTICS**: These targets were calculated using BeerSmith™ software and are based on the brewing method outlined on the back of this page.

³**EFFICIENCY**: This is the percent of sugar you expect to extract compared to the total amount of sugar available in your grain. Home brewers' efficiency can range between 65% to 75% depending on equipment and methods used. We use 70% here as an average, but your results may vary.

QUICK BREWING INSTRUCTIONS

MASH	<ol style="list-style-type: none"> 1.) Measure out your water. If you're using city water, it's best to run it slowly (about 1 gal/min) through a carbon filter while you're measuring. 2.) Heat water up to 2-5F more than your strike temperature to compensate for temperature loss while transferring to the mash tun. To minimize temperature loss, try warming up your mash tun by filling it with hot water and leaving it sealed for a few minutes before transferring. 3.) Slowly add your grain, constantly stirring to maximize exposure. 4.) Check that your temperature is on target and seal your mash tun. Once completely stirred in, your mash should have roughly the consistency of watery oatmeal. <p><i>Step Mashing:</i> This recipe utilizes step mashing which calls for two "rests" in specific temperature ranges. This kind of mashing is best accomplished with a mash tun that can be heated from the bottom in order to increase the temperature from protein rest to saccharification. If you are working with plastic cooler mash tuns, we would suggest either 1.) removing a gallon of the wort, heating it to a boil and adding it back in (referred to as "decoction") or 2.) skipping the protein rest and focusing on the saccharification (this may reduce efficiency).</p>	<p>Mash Targets:</p> <p>Volume: 6.45 gal Protein Rest Strike Temp: 138F Mash Temp: 132F Duration: 15 min Saccharification Rest: Mash Temp: 154F Duration: 60min</p> <p><i>Don't forget to add your first wort hop addition!</i></p>
LAUTER & SPARGE	<ol style="list-style-type: none"> 1.) Heat up your sparge water to 2-5F higher than desired sparge temperature. Then, transfer the water to the hot liquor tank (HLT) and carefully place your HLT in position above the mash tun. 2.) Position your kettle below the mash tun to prepare for the lauter. 3.) Recirculate your mash. Partially open the valve on your mash tun so that a moderate stream of sweet wort comes out. Use 2 pitchers or large measuring cups to catch this stream; you will notice a lot of small particles floating in the wort for the first couple minutes. As each pitcher fills, replace it with the empty and gently pour the full pitcher back into the mash tun. Continue doing this until you your wort is free of particulates. 4.) Begin lautering into the kettle. Set up sparge arm above grain bed and open valve on HLT partway to begin sparge. Adjust flow rates out of your mash tun and HLT to maintain 1 inch or so of water above the grain bed. Continue until you reach your target boil volume. 	<p>Sparge Targets:</p> <p>Volume: 3.26 gal Temp: 170F</p> <hr/> <p>Boil Targets:</p> <p>Volume: 8.24 gal Duration: 60 min</p>
BOIL	<ol style="list-style-type: none"> 1.) Bring your wort to a boil. Watch for boil overs! Once you achieve a stable, rolling boil, slowly add your first hop addition and start your timer for 60 minutes (counting down). Add all subsequent boil additions at their appropriate times. 2.) Sanitize any equipment that will come into contact with your wort after the boil: airlock, stopper, wine thief, aeration stone, etc. 3.) Add your wort chiller to the pot near the end of the boil. You want it to spend a couple minutes at boiling temperatures to sanitize it. Be sure to connect the hoses before putting it into your pot. 4.) Once you're finished boiling, start your cooldown by turning on the hose connected to your wort chiller to a slow rate of flow. The water coming out should be steaming hot, so be sure the outflow hose is directed somewhere safe. <ol style="list-style-type: none"> a. Remember that you can increase the effectiveness of the wort chiller by agitating the wort in the pot or connecting another coil and submerging it in ice water to act as a pre-chiller. 5.) Use a sanitized metal spoon to rapidly stir your cooled wort to create a whirlpool. The hop sediment and other break material will be sucked to the center of the pot, and if you allow it to settle for 10-15 min, it will sink to the bottom. This allows you to rack off the clear wort, leaving the trub behind. 6.) Once cooled to fermentation temperature, whirlpoiled, and settled out, rack into sanitized fermentor. 	<p>BOIL ADDITIONS 60 MIN</p> <hr/> <p>45 MIN <i>Watching wort boil is dull work. Have a homebrew!</i></p> <hr/> <p>20MIN</p> <ul style="list-style-type: none"> • 0.75 oz Cascade • 0.75 oz Willamette • Clarifier & Nutrient <hr/> <p>5 MIN</p> <ul style="list-style-type: none"> • 1.09 oz Cascade • 1.09 oz Willamette <hr/> <p>0 MIN (Flame Out)</p>
PITCH	<ol style="list-style-type: none"> 1.) Take a sample of your wort and use your hydrometer to measure your original gravity. 2.) Oxygenate your wort by shaking the carboy for 5 min or spraying pure O₂ for 30 seconds. 3.) Sanitize the exterior of the yeast package and use sanitized scissors to open. 4.) Add your yeast to your fermentor. Fill your airlock with sanitizer and fix in place with the stopper. 	<p>PITCH</p> <ul style="list-style-type: none"> • WLP001 California Ale Yeast <p><i>Ferment temp: 64F for 5 days, then ramp up to 72F</i></p>
DRY HOP	<ol style="list-style-type: none"> 1.) To add extra hop aroma to this recipe by dry-hopping, add your hop addition 4 days after pitching your yeast. 2.) Remove airlock, add your dry hop addition to the fermentor (no need to sanitize the hops), reinstall airlock. 3.) Wait 6 days before packaging. 	<p>DRY HOP</p> <ul style="list-style-type: none"> • 1.74 oz Cascade • 1.75 oz Willamette

THESE MEASUREMENTS CAN VARY WITH DIFFERENT EQUIPMENT, BREWING PROCEDURES, AND BOIL TEMPERATURES. FOR MORE IN-DEPTH BREWING INSTRUCTIONS, PLEASE SEE OUR "ALL GRAIN BREWING INSTRUCTIONS."