

# Larrys Lager-20190706.xlsx

Category: 4. Pale Malty European Lager  
 Style: 4A. Munich Helles

Brewer: BEER-N-BBQ by Larry  
 Brew Date: July 6, 2019

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Grain Bill, Adjuncts, & Sugars		
Type	Qty lb	% of Bill
Pilsner Malt: Premium Pilsen Malt (Avangard Malz)	5.25	52.5%
Pale Malt: Brewers Malt, 2-row (Briess)	4.25	42.5%
Vienna Malt: Goldpils® Vienna Malt (Briess)	0.50	5.0%

Recipe Outputs		
	Design	Actual
Extract Eff.:	75.0%	83.0%
Brewhouse Eff.:	67.2%	74.8%
Pre-Boil SG:	1.039	1.042
O.G.:	1.046	1.049
F.G.:	1.008	1.011
Ferm Vol:	22.0	23.0
Batch Vol:	20.0	
App Atten:	83.0%	76.6%
IBUs:	19	17
ABV:	5.0%	4.9%
SRM:	3.3	3.0

Water Information		
Chicago (Lake Michigan)		
ppm (mg/L)	Orig.	Adj.
Calcium	37	37
Magnesium	12	12
Sodium	9	9
Chloride	16	16
Sulfate	25	25
Alkalinity	102	
Cl/SO <sub>4</sub> Ratio	0.64	0.64

Water Additions (grams)		
	Mash	Sparge
Gypsum	0.0	0.0
Cal Chloride	0.0	0.0
Epson Salt	0.0	0.0
Slaked Lime	0.0	0.0
Baking Soda	0.0	0.0
Chalk	0.0	0.0

Yeast Information		
Fermentis		
SafLager W-34/70		
Ferm Temp:	54-59	°F

Forced Carbonation		
CO2 Volume	2.7	
Temperature	38.0	°F
Pressure	13.3	PSI

Hop Bill & Schedule					
Species	Type	Alpha (%)	Qty oz	AAU	Time (min)
Tettnanger (U.S.)	Pellet	3.2	1.00	3.2	60
Tettnanger (U.S.)	Pellet	3.2	1.00	3.2	20
Tettnanger (U.S.)	Pellet	3.2	1.00	3.2	5

Other Ingredients/Additions	Amount	When
Whirfloc tablet	1	15 min
yeast nutrient	1 tsp	boil
Gelatin	.5 tsp	post-ferm

Brewing Process Parameters				
Name	Design	Actual	Units	
Total Water Req'd	33.53		qt	
Ambient Grain Temp	68.0		°F	
Desired Mash Temp	148.0		°F	
Strike Water Volume	15.00	15.50	qt	
Strike Water Temp	158.7		°F	
Estimated Mash pH	5.8			
Mash Time	90	90	min	
Sparge Water Volume	18.53	19.00	qt	
Fly Sparge	-	-	-	
	-	-	-	
	Time Req'd	18.53	min	
Flow Rate	1.00		qt/min	
Pre-Boil Volume	28.53	29.40	qt	
Grain Absorption Rate	0.50	0.51	qt/lb	
Preferred SG Tool	Hydrometer			
Pre-Boil SG Grains Only	Hydro. Corr SG	1.039	1.037 1.042	Temp 96.0
	Refract. Corr SG	9.8	10.4 1.042	° Brix ° Brix
	Extract Efficiency (Grains Only)	75.0%	83.0% 81.9%	Hydro. Refrac
Pre-Boil SG Total	Hydro. Corr SG	1.039	1.037 1.042	Temp 96.0
	Refract. Corr SG	9.8	10.4 1.042	° Brix ° Brix
	Boil Time	90	90	min
Post-Boil Volume	24.55	27.20	qt	
Boil-Off Rate	2.00	0.81	qt/hr	
Original Gravity	Hydro. Corr SG	1.046	1.044 1.049	Temp 93.0
	Refract. Corr SG	11.4	11.8 1.048	° Brix ° Brix
	Fermenter Volume	22.00	23.00	qt
Hop Absorption Rate	0.10	0.65	qt/oz	
Final Gravity	Hydro. Corr SG	1.008	1.010 1.011	Temp 73.0
	Refract. Corr SG	2.0	6.1 1.012	° Brix ° Brix
	Target Batch Size	20.0		qt

NOTES: Multi-step mash schedule: Acid rest @110 for 60 min to lower mash pH (next time buy acidulated malt or lactic acid), beta-amylase @145 for 15 min, alpha-amylase @158 for 15 min, mash out @167 for 10 min.  
 Ferment under pressure (15 psi max) at 65-70 F. Wait a couple extra days for diacetyl rest to finish. Rack to keg and chill into the mid 30's F. Add gelatin (after preparing per instructions). Purge CO2 from head space. Force carbonate for at least another day.  
 Gelatin Instructions: Boil 1/4 cup water for a few minutes to sanitize it. Allow to cool a bit (<-170 F). Mix in 1/2 tsp gelatin.