

14 Reynard

Step 1: Enter Starting Water Profile

	Calcium (Ca ppm)	Magnesium (Mg ppm)	Sodium (Na ppm)	Chloride (Cl ppm)	Sulfate (SO ₄ ppm)	<input checked="" type="radio"/> Bicarbonate (HCO ₃ ppm) <input type="radio"/> Alkalinity (CaCO ₃ ppm)
A. Profile						
Starting Water Profile: (ppm = mg/L)	41	9	67	0	44	178
B. Volume						
Mash Water						
Volume (liters):	3,3	5,84				
(gallons):	0,87	1,54				
% that is Distilled or RO:	0%	0%				

If your water report gives Sulfate as Sulfur (SO₄-S) such as a Ward Lab's report, multiply by that by 3 to get SO₄

Step 2: Enter Grain Info

	Select Grain Type	Weight (kg)	Color (°L) (Crystal Malts Only)	Distilled water Mash pH (from chart)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">grain types</th> <th style="width: 40%;">dist water pH</th> </tr> </thead> <tbody> <tr><td>1 - Select Grain -</td><td></td></tr> <tr><td>2 Base - 2-Row</td><td>5,70</td></tr> <tr><td>3 Base - 6-Row</td><td>5,79</td></tr> <tr><td>4 Base - Maris Otte</td><td>5,77</td></tr> <tr><td>5 Base - Munich</td><td>5,43</td></tr> <tr><td>6 Base - Pilsner</td><td>5,75</td></tr> <tr><td>7 Base - Wheat</td><td>6,04</td></tr> <tr><td>8 Base - Vienna</td><td>5,56</td></tr> <tr><td>9 Base - Other</td><td>5,70</td></tr> <tr><td>10 Crystal Malt</td><td>calculated</td></tr> <tr><td>11 Roasted/Toasted</td><td>4,71</td></tr> </tbody> </table>	grain types	dist water pH	1 - Select Grain -		2 Base - 2-Row	5,70	3 Base - 6-Row	5,79	4 Base - Maris Otte	5,77	5 Base - Munich	5,43	6 Base - Pilsner	5,75	7 Base - Wheat	6,04	8 Base - Vienna	5,56	9 Base - Other	5,70	10 Crystal Malt	calculated	11 Roasted/Toasted	4,71
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Crystal Malt: Caramel malts, Cara Munich, Cara Aroma, etc.	Crystal Malt ▼	0,8	11,8	5,16																									
	Base - Maris Otte ▼	0,3		5,77																									
	- Select Grain - ▼	0		0,00																									
Roasted/Toasted Malt: Roasted Barley, Black Patent, Carafo, etc.	- Select Grain - ▼	0		0,00																									
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Acidulated Malt: Enter in Step 4a.	- Select Grain - ▼	0		0,00																									
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Total Grain Weight (kg):		1,1																											
(lbs):		2,4																											
Mash Thickness:		3 l/kg																											
		1,44 qt/lb																											

The above values are used to calculate mash pH. They may vary depending on maltster or other factors - for example Rahr 2-Row has been found to be 5.56. Modify if necessary.

Step 3: View Mash pH

Effective Alkalinity (CaCO ₃ ppm)	Residual Alkalinity	ESTIMATED Room-Temp Mash pH	Desired Room-Temp Mash pH	
178	-122	5,20	5.4 - 5.6	<p>Note: When measuring actual mash pH with a meter, keep in mind that it can take up to 15 minutes for mash pH to stabilize.</p> <p>There are varying opinions on the optimum range here. Consider doing your own research and/or experimentation to determine what's best for you.</p>

Step 4a: Adjust Mash pH DOWN (if needed)

	Gypsum CaSO ₄	Calc. Chloride CaCl ₂	Epsom Salt MgSO ₄	Acidulated Malt acid content: grams: oz:	Lactic Acid acid content: ml:
add at dough-in or prior.					
Mash Water Additions (grams):	0	4,49	0,09	2,0%	80%
Adjusting Sparge Water? (y/n):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	
Sparge Water Additions (grams):	0,0	0,0	0,0	0,0	
(0% of total wt) Typically 2.0%. Revise if necessary. Some recommend keeping this under 3%					

add to boil, or to sparge water prior to sparging, or combine with mash salts when treating all water combined prior to brewing.

Step 4b: Adjust Mash pH UP (if needed)

	Slaked Lime Ca(OH) ₂	Baking Soda NaHCO ₃	Chalk CaCO ₃	<p>Calculations for chalk's true affect on pH are very complex and may require an acid to fully dissolve. This spreadsheet uses half of chalk's full potential based on experimental data w/o acid addition. Results may vary.</p>
add at dough-in or prior.				
Mash Water Additions (grams):	0	0,18	0	
Adjusting Sparge Water? (y/n):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sparge Water Additions (grams):	0,0	0,0	0,0	

add to boil, or to sparge water prior to sparging, or combine with mash salts when treating all water combined prior to brewing.

Step 5: View Resulting Water Profile

	Calcium (Ca ppm)	Magnesium (Mg ppm)	Sodium (Na ppm)	Chloride (Cl ppm)	Sulfate (SO ₄ ppm)	Chloride / Sulfate Ratio
Mash Water Profile:	412	12	82	656	55	12,01
Mash + Sparge Water Profile:	175	10	72	237	48	4,95
Palmer's Recommended Ranges:	50 - 150	10 - 30	0 - 150	0 - 250	50 - 350	Above 1.3 may enhance maltiness

There are varying opinions on these ranges. Consider doing your own research and/or experimentation to determine what's best for you.