

# Water Treatment

**Brewer's Worksheet**  
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## DATA ENTRY UNITS

|                         |                 |
|-------------------------|-----------------|
| Brewing Liquor Volume   | <b>gals</b>     |
| Liquor Adjustment Salts | <b>grams</b>    |
| Grain Weights           | <b>lbs</b>      |
| Beer Color              | <b>lovibond</b> |
| Specific Gravity        | <b>sg</b>       |
| Hop Weights             | <b>grams</b>    |

## CHOICES

gals, liters  
 ozs, grams  
 lbs, kgs  
 lovibond, ebc  
 sg, plato  
 ozs, grams

## CO

Brewing  
 Liquor /

## FACTORS

|                                    |             |
|------------------------------------|-------------|
| Mash Time to Full Color Developm   | <b>1:30</b> |
| Expected Grain Extraction Rate     | <b>75%</b>  |
| Pellets Alpha Acid Isomerization R | <b>31%</b>  |
| Leaf Alpha Acid Isomerization Rat  | <b>26%</b>  |

## RECIPE

Brewing Liquor Volume  **Err:508**

Water Treatment

|                    |                      |                |
|--------------------|----------------------|----------------|
| Calcium Carbonate  | <input type="text"/> | <b>Err:508</b> |
| Calcium Chloride   | <input type="text"/> | <b>Err:508</b> |
| Calcium Sulfate    | <input type="text"/> | <b>Err:508</b> |
| Magnesium Sulfate  | <input type="text"/> | <b>Err:508</b> |
| Potassium Chloride | <input type="text"/> | <b>Err:508</b> |
| Sodium Chloride    | <input type="text"/> | <b>Err:508</b> |

Grain Bill **Err:508** Grain

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Mash Time

Hopping **Err:508** Hops Alpha Acid Boil Time

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## Water Treatment

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### ————— CALCULATORS —————

#### Water Treatment Calculator

|           | My Water                  | Target Water     | Difference Before Treatment |
|-----------|---------------------------|------------------|-----------------------------|
| Calcium   |                           |                  |                             |
| Carbonate |                           |                  |                             |
| Chloride  |                           |                  |                             |
| Magnesium |                           |                  |                             |
| Potassium |                           |                  |                             |
| Sodium    |                           |                  |                             |
| Sulfate   |                           |                  |                             |
|           |                           |                  |                             |
|           | ————— ALT ADDITION: ————— |                  |                             |
|           | Calcium Carbonate         | Calcium Chloride | Calcium Sulfate             |
|           | Err:508                   | Err:508          | Err:508                     |
| Calcium   | Err:508                   | Err:508          | Err:508                     |
| Carbonate | Err:508                   | Err:508          | Err:508                     |
| Chloride  | Err:508                   | Err:508          | Err:508                     |
| Magnesium | Err:508                   | Err:508          | Err:508                     |
| Potassium | Err:508                   | Err:508          | Err:508                     |
| Sodium    | Err:508                   | Err:508          | Err:508                     |
| Sulfate   | Err:508                   | Err:508          | Err:508                     |

#### Grain Color and Extract Calculator

| Weight  | Grain | Ingredient Color | Extraction  |
|---------|-------|------------------|-------------|
| Err:508 |       | Err:508          | Err:508     |
|         |       | Err:508          | Err:508     |
|         |       | Err:508          | Err:508     |
|         |       | Err:508          | Err:508     |
|         |       | Err:508          | Err:508     |
|         |       | Err:508          | Err:508     |
|         |       | Err:508          | Err:508     |
|         |       | Err:508          | Err:508     |
|         |       | Err:508          | Err:508     |
|         |       | Err:508          | Err:508     |
|         |       | Err:508          | Err:508     |
|         |       | Err:508          | Err:508     |
|         |       |                  | Theoretical |
|         |       |                  | Err:508     |
|         |       |                  | Err:508     |
|         |       |                  | Err:508     |
|         |       | Beer Color       | Expected    |
|         |       | Err:508          | Err:508     |
|         |       | Err:508          | Err:508     |

Hop Bitterness Calculator

|         |      |            |                   |
|---------|------|------------|-------------------|
|         |      |            |                   |
| Err:508 | Hops | Alpha Acid | Boil Time         |
|         |      |            | Total Internation |

**INVERSION UNITS**——

|                  |  |             |
|------------------|--|-------------|
| g Liquor Volume  |  | <—Bad Value |
| Adjustment Salts |  | <—Bad Value |
| Grain Weights    |  | <—Bad Value |
| Beer Color       |  | <—Bad Value |
| Specific Gravity |  | <—Bad Value |
| Hop Weights      |  | <—Bad Value |

Leaf/Pellet

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# Water Treatment

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| Difference After Treatment | Total PPM          |                 | Calcium Carbonate | Calcium Chloride |
|----------------------------|--------------------|-----------------|-------------------|------------------|
| Err:508                    | Err:508            | Calcium         | 40.00%            | 36.10%           |
| Err:508                    | Err:508            | Carbonate       | 60.00%            |                  |
| Err:508                    | Err:508            | Chloride        |                   | 63.90%           |
| Err:508                    | Err:508            | Magnesium       |                   |                  |
| Err:508                    | Err:508            | Potassium       |                   |                  |
| Err:508                    | Err:508            | Sodium          |                   |                  |
| Err:508                    | Err:508            | Sulfate         |                   |                  |
|                            |                    |                 |                   |                  |
| Magnesium Sulfate          | Potassium Chloride | Sodium Chloride |                   |                  |
| Err:508                    | Err:508            | Err:508         |                   |                  |
| Err:508                    | Err:508            | Err:508         |                   |                  |
| Err:508                    | Err:508            | Err:508         |                   |                  |
| Err:508                    | Err:508            | Err:508         |                   |                  |
| Err:508                    | Err:508            | Err:508         |                   |                  |
| Err:508                    | Err:508            | Err:508         |                   |                  |
| Err:508                    | Err:508            | Err:508         |                   |                  |
| Err:508                    | Err:508            | Err:508         |                   |                  |

|              |  |  |                |           |
|--------------|--|--|----------------|-----------|
| Extract Rate |  |  |                |           |
|              |  |  | Grain          | — Applied |
|              |  |  |                | Err:508   |
|              |  |  |                | Err:508   |
|              |  |  | 6 row          | Err:508   |
|              |  |  | 2 row          | Err:508   |
|              |  |  | English Pale   | Err:508   |
|              |  |  | English Mild   | Err:508   |
|              |  |  | Munich         | Err:508   |
|              |  |  | Vienna         | Err:508   |
|              |  |  | Crystal 20     | Err:508   |
|              |  |  | Crystal 40     | Err:508   |
|              |  |  | Crystal 60     | Err:508   |
|              |  |  | Crystal 80     | Err:508   |
|              |  |  | Crystal 120    | Err:508   |
|              |  |  | Cara-Pils      | Err:508   |
|              |  |  | Scotch         | Err:508   |
|              |  |  | Chocolate      | Err:508   |
|              |  |  | Roasted Barley | Err:508   |
|              |  |  | Black Patent   | Err:508   |
|              |  |  | Barley         | Err:508   |

# Water Treatment

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|                  |                  |
| Leaf/Pellet      | Bitterness Units |
|                  | Err:508          |
|                  | Err:508          |
|                  | Err:508          |
|                  | Err:508          |
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|                  | Err:508          |
|                  | Err:508          |
| al Bitterness Un | Err:508          |

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|----------|---------|
| Oats     | Err:508 |
| Corn     | Err:508 |
| Rice     | Err:508 |
| Wheat    | Err:508 |
| Other 1  | Err:508 |
| Other 2  | Err:508 |
| Other 3  | Err:508 |
| Other 4  | Err:508 |
| Other 5  | Err:508 |
| Other 6  | Err:508 |
| Other 7  | Err:508 |
| Other 8  | Err:508 |
| Other 9  | Err:508 |
| Other 10 | Err:508 |
| Other 11 | Err:508 |
| Other 12 | Err:508 |
| Other 13 | Err:508 |
| Other 14 | Err:508 |
| Other 15 | Err:508 |
| Other 16 | Err:508 |
| Other 17 | Err:508 |
| Other 18 | Err:508 |
| Other 19 | Err:508 |
| Other 20 | Err:508 |

# Water Treatment

N PERCENTAGES LOOKUP TABLE

| Calcium Sulfate | Magnesium Sulfate | Potassium Chloride | Sodium Chloride |
|-----------------|-------------------|--------------------|-----------------|
| 23.30%          |                   |                    |                 |
|                 |                   | 47.60%             | 30.35%          |
|                 | 9.90%             | 52.40%             |                 |
|                 |                   |                    | 39.30%          |
| 55.80%          | 39.00%            |                    |                 |

ALT VALUES TABLE

| Values — | — Reference Values — |              |
|----------|----------------------|--------------|
| Err:508  | Color                | 100% Extract |
| Err:508  | EBC kg/l             | °Plato kg/l  |
| Err:508  | 38.6                 | 75.1         |
| Err:508  | 34.1                 | 75.1         |
| Err:508  | 56.2                 | 75.1         |
| Err:508  | 82.7                 | 75.1         |
| Err:508  | 111.4                | 75.1         |
| Err:508  | 78.3                 | 75.1         |
| Err:508  | 475.5                | 66.7         |
| Err:508  | 938.9                | 66.7         |
| Err:508  | 1,424.5              | 66.7         |
| Err:508  | 1,865.8              | 66.7         |
| Err:508  | 2,748.5              | 66.7         |
| Err:508  | 34.1                 | 75.1         |
| Err:508  | 652.1                | 66.7         |
| Err:508  | 8,817.3              |              |
| Err:508  | 8,817.3              |              |
| Err:508  | 11,465.5             |              |
| Err:508  | 34.1                 | 75.1         |

Water Treatment

|         |      |      |
|---------|------|------|
| Err:508 | 34.1 | 75.1 |
| Err:508 | 12.1 | 75.1 |
| Err:508 | 12.1 | 75.1 |
| Err:508 | 38.6 | 75.1 |
| Err:508 |      |      |
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