

## Munich Dunkel - 5.8%

### Munich Dunkel

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Type: All Grain

IBU : 29 (Tinseth)  
 BU/GU : 0.52  
 Color : 29 EBC  
 Carbonation : 2.4 CO2-vol

Pre-Boil Gravity : 1.047  
 Original Gravity : 1.056  
 Final Gravity : 1.012

### Fermentables (5.65 kg)

5 kg - Munich 10.5 EBC (88.5%)  
 500 g - Cookie 60 EBC (8.9%)  
 150 g - Carafa Special I 900 EBC (2.7%)

### Hops (40 g)

60 min - 15 g - Hallertau Magnum - 16% (25 IBU)  
 10 min - 25 g - Tettnang - 4.5% (4 IBU)

### Miscellaneous

Mash - 3.5 g - Calcium Chloride (CaCl2)  
 Mash - 1 g - Gypsum (CaSO4)  
 Mash - 4 ml - Lactic Acid 80%  
 Sparge - 2.64 g - Calcium Chloride (CaCl2)  
 Sparge - 0.76 g - Gypsum (CaSO4)

### Yeast

1 pkg - Mangrove Jack's Bavarian Lager M76

### Starter

Step 1: 2.7 L (265 g DME / 324 g LME)  
 521 billion yeast cells  
 21 million cells / ml

### Brewtools B80pro

Batch Size : 25 L  
 Boil Size : 30.54 L  
 Post-Boil Vol : 26.04 L

Mash Water : 21.21 L  
 Sparge Water : 16.02 L  
 Boil Time : 60 min  
 Total Water : 37.23 L

Brewhouse Efficiency: 80%  
 Mash Efficiency: 80%

### Mash Profile

High fermentability  
 65 °C - 60 min - Temperature  
 76 °C - 15 min - Temperature

### Fermentation Profile

Ale  
 20 °C - 14 days - Primary

### Water Profile

Muurame (Dark Lager)  
 Ca 62 Mg 2 Na 8 Cl 84 SO 31 HCO 29

SO/Cl ratio: 0.4  
 Mash pH: 5.23

### Measurements

Mash pH:

Boil Volume:

Pre-Boil Gravity:

Post-Boil Kettle Volume:

Original Gravity:

Fermenter Top-Up:

Fermenter Volume:

Final Gravity:

Bottling Volume:



29 EBC