

## Dopplebock: Ingredients & Brewing Notes

**Water:** Munich water profile has high-carbonate hardness. Carbonate content buffers the liquids during mash to prevent over-acidification. Besides the carbonate content, Munich water is fairly soft. Example of Munich water analysis:

Carbonate	148 mg/L
Calcium	75 mg/L
Magnesium	18 mg/L
Sodium	2 mg/L
Chloride	2 mg/L
Sulfate	10 mg/L

**Malt:** Use of Munich or Vienna malt should dominate this style, with up to 80% of malt bill. Good 2 row pale malt should be used at 10-15% of malt bill. Crystal is appropriate at 5 – 10%. Use of chocolate or other high-temperature kilned malts should be minimized (no more than 1-2% of grist). Roasted malts are not appropriate for style.

**Hops:** Noble hops, such as Hallertauer-Hersbrucker or Tettnager. American varieties include Liberty, Mt. Hood. Hop rates will be low for Dopplebock style with a rich malt flavor being dominant characteristic.

**Yeast:** Bavarian yeast which can handle the high-gravity/alcohol characteristic of the style. As with other high-gravity beers, must use a healthy, large starter. Appropriate commercial yeasts include: White Labs WLP833, (German Bock Lager Yeast) or WYeast 2206 (Bavarian lager yeast). Both work well in the 48 – 55° F. range and can tolerate moderate-high alcohol content.

**Mash:** Two schools of thought as to whether decoction or simple infusion mash schedules should be used. Overall goal is to make high-extract wort with a lot of malt character. Lower molecular weight proteins and longer chain sugars are emphasized.

Decoction mash preferred by “traditionalists” that can include single, double or triple decoction schedule. The claim is that a simple infusion mash will result in a malt extract that has more starch, more protein and less color that is achieved with a decoction mash.

Many, however, claim that beers made with simple infusion mash are indistinguishable from those made with a decoction. Compromise may include a mash schedule with a low temperature rest (~ 149 ° F.) and another at the high end of the range (~ 158 ° F.).

**Boil:** Long boil of 1 ½ - 3 hours should be conducted to concentrate wort and melanoidins. Add bittering hops in last 60 – 90 minutes.

**Fermentation & Lagering:** Ferment as cool as possible (as close to 40–45° F.) as yeast can handle and gradually warming to 50-55° F. to prevent flocculation. Primary fermentation should continue to 1/3 of the starting gravity. For example if O.G = 1.072, gravity should be no higher than 1.024 after primary. Can follow with a 1 – 2 day diacetyl rest ~ 62° F. and then a lagering period of 4 weeks or more at or near 32° F.