

Tech Corner

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What does it mean for a malt to have a dry basis fine grind (DBFG) extract yield of 78%? To answer this question we begin with sucrose or ordinary table sugar. If you dissolve 1 pound of sucrose in 1 gallon of water the mixture will have 46.21 gravity units or a specific gravity (SG) of 1.04621. If your malt has a DBFG of 78%, then the maximum potential yield of the malt is 78% of the yield for sucrose, that is, $78\% * 46.21$ or 36.04 gravity units (SG of 1.03604) for 1 pound of malt in a gallon of water. Can all-grain brewers achieve this maximum yield? The answer is no for the following reasons:

- DBFG assumes a zero malt moisture content which is not true in real settings. Malt typically has a moisture content of 4%, but it may vary.
- DBFG is determined under laboratory conditions which are difficult for all-grain brewers to reproduce.
- The grains are crushed according to “fine grind” specifications. Brewers typically mill their grain more “coarsely” to avoid a stuck mash during lautering. Also, note that malt extract yield goes down the more coarsely you mill your grains.

Another malt extract yield measure is the dry basis coarse grind (DBCG) extract yield percentage. For example, your malt may have a DBCG of 76.5%, which means the potential extract yield is 76.5% of the yield for sucrose. This measure also assumes zero moisture content and is determined under laboratory conditions; however, the grain is milled under “coarse grind” specs. These specs are similar to the way brewers mill their grains but brewers will not achieve this potential extract yield because of malt moisture content and better efficiencies obtained in the laboratory.

An extract yield metric that factors in moisture content is the As Is Coarse Grind (AICG) yield extract percentage, defined as:

$$\text{AICG} = \text{DBCG} / (1 + \text{moisture content}) - .002$$

For example, if your malt has DBCG equal to 76.5% and the moisture content of your malt is 4% then the AICG is:

$$\text{AICG} = .765 / 1.04 - .002 = .7336$$

Or an extract yield percent of 73.36% of the yield for sucrose.

Unfortunately, the brewer will not achieve this potential extract yield because it assumes 100% efficiency during mashing. Typical all-grain home brewers will achieve around 75% efficiency during mashing but this value is highly dependent on mashing equipment and processes.

Finally, to get the extract yield produced by the brewer during mashing, we multiple the AICG by the mashing efficiency percentage. Continuing our example, with AICG equal to .7336, if your mashing efficiency is 75%, then you can expect the malt to yield an extract of $75\% * .7336$ or .5502. That is, the

expected extract yield is 55.02% of the yield of sucrose. This percent translates to $.5502 * 46.21$ or 25.4 gravity units (SG of 1.0254) for 1 pound of malt in a gallon of water.

If you would like to read more about malt extract yield, here is a good resource:

New Brewing Lager Beer, by Gregory J. Noonan