

## HOP GRIND SENSORY EVALUATION METHOD

The brewing industry is in need of a rapid and standardized hop preparation method to evaluate the aromas present in raw hops. Hop breeders, vendors, researchers, and brewers have historically evaluated hop aroma by rubbing hops. This method can be messy, requires the destruction of a large sample size, and can be variable based on rub vigor (duration, pressure, and temperature produced). There is a demand for a fast and affordable hop sensory method that is both sensitive and repeatable. Such a method is needed to serve as a resource for quality programs to evaluate hops as a raw brewing material and for research programs to explore potentially unique or desirable aromas in developing hop varieties.

The hop grind method offers the following advantages: the hops can be prepared in a short period of time, with samples being produced in approximately 5 min (Ref. 1). The method can be performed using significantly less hop material than required in the rub, and lastly, the hop grind method is not messy and does not have the same risk of aroma carryover as the rub method.

### Reagents

- (a) *Hop pellets or whole cones.*
- (b) *70% isopropyl alcohol, CAS No. 67-63-0.*

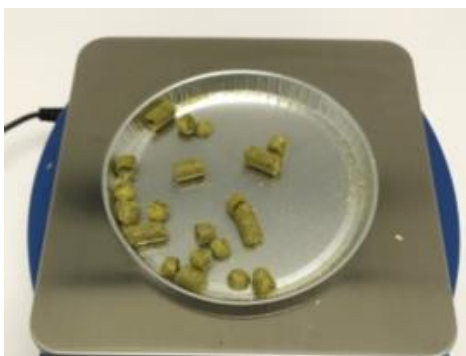


Fig. 1. Hop pellets.



Fig. 2. Hop cones.

### Apparatus

- (a) *Blade grinder, Magic Bullet grinder (or equivalent), 16-oz volume.*
- (b) *Amber screw-top glass jars, Teflon-lined closed-top cap, 4-oz volume (Scientific Specialties, item no. B72204 or similar).*
- (c) *Analytical balance, capable of weighing 50.0 g ( $\pm 0.1$  g).*

### Method

Using the analytical balance, weigh out 5 g of hop material.

Using the blade grinder, grind the hop material. For whole cones, grind for 20–30 s, shaking the grinder if necessary. For pellets, grind for 10–15 s. Grind until a coarse powder is achieved.

NOTE: Do not overgrind. Overgrinding the material results in a thick, sticky powder that is difficult to remove from the grinder. Grind time may vary by moisture content, variety, and so on.

Add ground material to labeled screw-top jar and tighten cap. There should be plenty of headspace in the jar.

NOTE: Take care that the material does not exceed the half-fill line, even if the quantity of hop material is adjusted to fill a different size jar than indicated above.

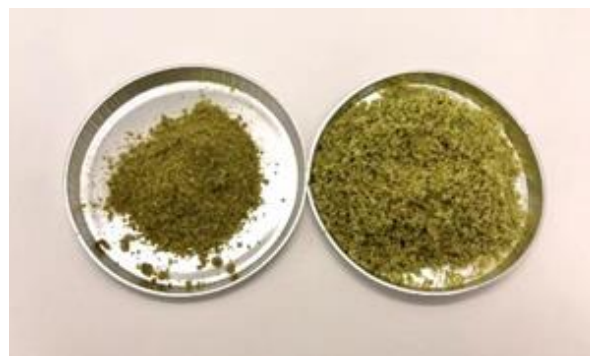


Fig. 3. Ground hop pellets (left) and hop cones (right).



Fig. 4. Ground hop material in sample jars.

Spray a paper towel with 70% isopropyl alcohol. Wipe down blade grinder and blending cup. Allow apparatus to air dry completely before preparing the next sample.

Perform hop sensory evaluation within 90 min of preparation. Serve at room temperature.

**Reference**

1. John I. Haas. <http://www.johnihaas.com/library/alternative-method-for-hop-aroma-evaluation-the-kostelecky-method/> (accessed 1 October 2017).

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