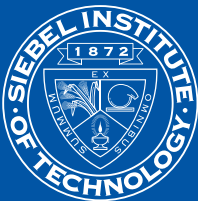


Sensory Training Kits



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1 SENSORY KIT INTRODUCTION

The Siebel Institute Sensory Training Kits are shipped in ready-to-use liquid form, making them as easy to use as possible.

Each kit is designed to help tasters build their skills towards understanding beer flavor at a truly professional level.

While breweries with established tasting panel structures will find these kits valuable, it can also be used for 'taster calibration' by others with an interest in beer including:

- Breweries training new and existing staff to spot beer defects more effectively
- Brewers guilds looking to add value to their regularly-scheduled meetings
- Homebrew groups and beer judges looking to sharpen judging and flavor recognition skills
- Distributors, wholesalers and agents who need to be able to 'talk the talk' about beer attributes with beer specialty retailers



2 FLAVOR DESCRIPTIONS

1	Acetaldehyde Green apple, cut grass	Common sources: Fermentation product, staling or contamination	Concentration: 45 mg/L	Threshold in beer: 10-20 mg/L
2	Acetic acid Vinegar-like	Common sources: Contamination (mash, bacteria or wild yeast)	Concentration: 360 mg/L	Threshold in beer: 60-120 mg/L
3	Almond (Benzaldehyde) Marzipan, Almonds	Common sources: Specific styles (Including Barrel Aging) yeast growth or raw materials	Concentration: 3.0 mg/L	Threshold in beer: 1.0 mg/L
4	Bitter (Isolone) Hoppy, bitter	Common sources: Hopping, hop addition	Concentration: 24 mg/L	Threshold in beer: 7-15 mg/L
5	Butyric acid Putrid, baby vomit	Common sources: Bacterial contamination	Concentration: 7.5 mg/L	Threshold in beer: 3.0 mg/L
6	Caprylic acid Soapy, fatty, candle wax	Common sources: Microbial contamination or yeast breakdown at maturation	Concentration: 31.5 mg/L	Threshold in beer: 5-10 mg/L
7	Contamination Sour & buttery	Common sources: Contamination (Lactobacillus)	Concentration: 0.6 mg/L 360 mg/L	Composition: Diacetyl Acetic Acid
8	D.M.S. (Dimethyl sulfide) Cooked corn or vegetables	Common sources: Wort boil, wort cooling or contamination	Concentration: 400 µg/L	Threshold in beer: 25-50 µg/L

2 FLAVOR DESCRIPTIONS

9	Diacytyl (2,3-Butanedione) Butter, butterscotch	Common sources: Microbial contamination or improper maturation	Concentration: 0.6 mg/L	Threshold in beer: 0.1-0.2 mg/L
10	Earthy (2-Ethyl fenchol) Geosmin, soil-like	Common sources: Packaging or water-derived contamination	Concentration: 15 µg/L	Threshold in beer: 5.0 µg/L
11	Ethyl acetate Solvent-like, nail polish remover	Common sources: Wort composition and yeast growth	Concentration: 120 mg/L	Threshold in beer: 20-40 mg/L
12	Ethyl hexanoate Aniseed, apple or licorice	Common sources: Fermentation product, wort composition or yeast health	Concentration: 0.6 mg/L	Threshold in beer: 0.2 mg/L
13	Geraniol Floral, geranium flowers	Common sources: Hop addition and variety	Concentration: 450 µg/L	Threshold in beer: 100-200 µg/L
14	Grainy (Isobutyraldehyde) Husk-like, nut-like	Common sources: Excessive run-off or insufficient wort boil	Concentration: 3.75 mg/L	Threshold in beer: 1.0-2.5 mg/L
15	Hefeweizen Spicy & banana	Common sources: Specific beer styles	Concentration: 120 µg/L 4.5 mg/L	Composition: Eugenol Isoamyl acetate
16	Indole Farm, barnyard	Common sources: Bacterial infection during fermentation	Concentration: 0.55 mg/L	Threshold in beer: 10-20 µg/L



17	Isoamyl acetate Banana, pear drop	Common sources: Fermentation product, wort composition or yeast health	Concentration: 4.5 mg/L	Threshold in beer: 1.0-1.5 mg/L
18	Isovaleric acid Cheesy, old hops, sweaty socks	Common sources: Use of old, degraded hops	Concentration: 6.0 mg/L	Threshold in beer: 1.0mg/L
19	Lactic acid Sour, sour milk	Common sources: Beer spoilage bacteria	Concentration: 400 mg/L	Threshold in beer: 140 mg/L
20	Light-struck (3-Methyl-2-butene-1-thiol) Skunky, toffee or coffee like	Common sources: Clear or green bottles	Concentration: 600 ng/L	Threshold in beer: 5-30 ng/L
21	Mercaptan (Ethanethiol) Sewer-like, drains	Common sources: Poor yeast health, autolysis	Concentration: 3.75 µg/L	Threshold in beer: 1.0 µg/L
22	Metallic (Ferrous sulfate) Metal, tin-like, blood	Common sources: Water sources, non-passivated vessels	Concentration: 3.75mg/L	Threshold in beer: 1.0mg/L
23	Papery (Trans-2-nonenal) Cardboard, oxidized	Common sources: Product of oxidation, staling	Concentration: 2 µg/L	Threshold in beer: 0.5 µg/L
24	Spicy (Eugenol) Cloves, all spice	Common sources: Microbial contamination, wild yeast or aging	Concentration: 120 µg/L	Threshold in beer: 40 µg/L

2 FLAVOR DESCRIPTIONS

25	Vanilla (Vanillin) Custard powder, vanilla essence	Common sources: Specific styles (barrel aged, common wood flavor)	Concentration: 150 µg/L	Threshold in beer: 40 µg/L
27	Exotic (g-Nonalactone) Coconut, Vanilla, Fruity, Glue-like	Common sources: Higher concentration in aged beers (Including Barrel Aged); Thermal load indicator of brewing process	Concentration: 0.06 mg/L	Hop varieties: Equinox, Amarillo, AU Topaz, Cascade
33	Woody (Caryophyllene and Humulene Fraction) Woody, Resinous	Common sources: Characteristic of the hop heavier volatiles and Present in some barrel aged beers	Concentration: 12.0 mg/L	Hop varieties: AU Topaz, GRTettang Fuggle
38	Tobacco (β-Damascenone) Natural, Woody, Sweet, Fruity, Plum, Spicy Tobacco, Nuances, Menthol-like	Common sources: A specific note found in higher concentrations in certain hop varieties and Present in some barrel aged beers	Concentration: 0.5 mg/L	Hop varieties: Hallertau Tradition & Blanc, Polaris, Aurora, Columbus, Czech Saaz
45	H2S Rotten eggs	Common sources: Fermentation, maturation or contamination	Concentration: 72 µg/L	Threshold in beer: 4 µg/L
46	Smoky (Syringol) Smoky (smoked wood/ smoked fish), Phenolic	Common sources: Present in Specific Styles and a Common Flavor Component in Barrel Aged Beers	Concentration: 97.1 mg/L	Threshold in beer: 1.8 mg/L
47	Peat-like (Guaiacol) Peat-like, Smoky, Woody, Medicinal	Common sources: Present in some barrel aged beers	Concentration: 1.35 mg/L	Threshold in beer: 10 mg/L



48	Barnyard (4-Ethylphenol) Barnyard, Horsey, Brett-related flavors, Wine-like, Alcohol	Common sources: Common in Many Beers Innoculated with Brettanomyces Also Present in some barrel aged beers	Concentration: 10.0 mg/L	Threshold in beer: 0.3 mg/L
49	Coconut (2-Heptanol) Dill, Earthy, Coconut	Common sources: Present in some barrel aged beers	Concentration: 22.4 mg/L	Threshold in beer: 0.5 mg/L
50	Caramel (5-Methyl Furfural) Caramel, Spicy, Sweet, Almond	Common sources: Present in Specific Styles and a Common Flavor Component in Barrel Aged Beers	Concentration: 147 mg/L	Threshold in beer: 50 mg/L
51	Whiskey (Lactone) Woody, Oakey, Coconut, Rum-like, Green	Common sources: Common Flavor Component in Barrel Aged Beers	Concentration: 18.1 mg/L	Threshold in beer: 0.4 mg/L
52	Pineapple (Ethyl Butyrate) Pineapple-like, Brett-related flavors, Rum-like, Tropical Fruit	Common sources: Common Flavor Component in Many Beers Innoculated with Brettanomyces, also Present in some barrel aged beers.	Concentration: 1.8 mg/L	Threshold in beer: 0.4 mg/L (ASBC)

3 SAMPLE PREPARATION

1



STEP 1:

To spike your beer sample: Find the appropriate vial. The painted band around the narrow neck of the vial (the white line) means that the vial is ready to open without scoring.

IMPORTANT:

If there is liquid above the white line in the vial, gently tap with your finger to get all the liquid to the bottom part of the vial.

2



STEP 2:

To open the vial, hold it with both hands, with one thumb against the narrow top section.

ADVICE:

You may want to protect your hands from broken glass by using a paper towel, light cloth or piece of gauze when opening the vial.

3



STEP 3:

Hold the bottom of the vial firmly while pushing the top section away from you with easy, even pressure. A light pressure should cleanly snap the vial open, while using too much force can cause it to shatter.

4



STEP 4:

Pour the entire contents of the vial into an empty, clean glass or container that is capable of holding the appropriate amount of beer as indicated on the kit's outer packaging.

Add the appropriate amount of beer to the glass or container. This will yield approximately three times the flavor threshold of the compound.

4 TASTING PROCEDURE

①



STEP 1:

Prepare a control (unspiked) and a spiked sample of beer. A typical serving is 80ml to 100ml per person.

IMPORTANT:

To remind you of the beer's original aroma and taste impression and to allow to directly compare the differences between both samples, always start the tasting procedure with your control sample followed by the spiked sample.

②



STEP 2: AROMA IMPRESSIONS

Swirl the glass gently. 'Drive' the sample by your nose while sniffing in for initial aroma impression. Use two or three short, sharp sniffs to allow the volatiles to reach the appropriate areas.

③



STEP 3: TASTE IMPRESSIONS

Take one or two small sips and allow the sample to sit on your tongue for taste impressions.

④



STEP 4: SWALLOW

Swallow the sample. This is necessary to allow evaluation of the sample's bitterness component.

5 MATERIAL SAFETY DATA SHEET

The Siebel Institute flavor standards are safe to consume once used as directed. For further information please consult the **Material Safety Data Sheet (MSDS)** available for download at <http://www.siebelinstitute.com/products/sensorykits/>



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