

Subtlety: Aromatic Soy Container Candles

ILLUMINATING COMBUSTION OF AROMATIC HYDROCARBONS

Why Candles?

Fun to make

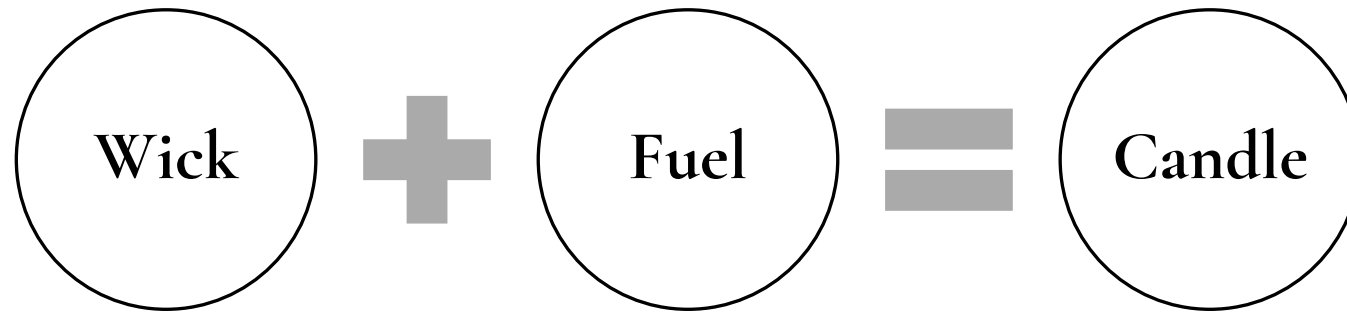
Great at-home activity

Set an Intention. Essential oils are resource intensive.

- Reduce Stress
- Calm
- Uplift
- Invigorate!

Candle Making

Deceptively *easy* but incredibly nuanced



Candle History

Ancient Civilizations

- Egyptians used wicked candles in 3,000 B.C., rush-lights or torches made by soaking the pithy core of reeds in melted animal fat .
- Ancient Romans are credited with inventing the actual wicked candle by repeatedly dipping rolled papyrus in melted tallow or beeswax.
- Religious importance: Hanukkah, the Festival of Lights, dates back to 165 B.C.; Constantine was reported to call for the use of candles during an Easter service in the 4th century.

Middle Ages (Beeswax , Guild and Wealth)

- Tallow was “king” until clean burning, sweet smelling beeswax candles were introduced in Europe.
- Due to Beeswax’s expense, candles were mostly used for church ceremonies and by the wealthy.
- By the 13th century, candle making become a guild craft in England and France.
- “Chandlers” either visited homes to make candles or sold them from their own shops.

Candle History

American Colonial Times (Bayberry & Whaling)

- Bayberry candles were created from the waxy berries of the plant which grows abundantly along the East coast of North America
- Spermaceti — a wax obtained by crystallizing sperm whale oil — became available in quantity with the boom of the whaling industry. Similar to beeswax it smelled better tallow, produced a brighter light & was harder than tallow and beeswax.

19th Century Advances (Industrial Age & Chemistry)

- French chemist Michel Eugene Chevreul discovered how to extract stearic acid from animal fatty acids which lead to the development of stearin wax, a hard, durable and clean burning wax.
- Mechanization of candle making in 1834 by Joseph Morgan who created a process where molded candles could be produced by using a cylinder with a movable piston to eject candles as they solidified.
- The clean burning Paraffin wax (a waxy substance from petroleum) was introduced in the 1850s.
- Candle making began to decline with the electric light bulb in 1879.

The 20th Century:

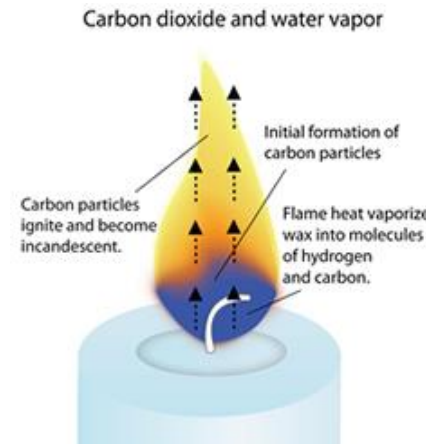
The 1990s saw the introduction of soybean wax and palm wax.

Candle Science

Wax is the fuel and the **wick** burns and melts the fuel into a liquid.

Enough heat is created to radiate back and melt more wax to keep the **combustion** process going until the fuel is used up or the heat is eliminated.

Capillary action: the ability of a liquid to flow in narrow spaces without the assistance of, or even in opposition to, external forces like gravity (e.g., paper towel passively absorbing water)



Combustion: rapid chemical combination of a substance with oxygen, involving the production of heat and light

Hydro-Carbons

Candle making is ancient and goes way back in time to working with fats/lipids/oils which were also used in soaps and cosmetic/medicinal applications

Candles are more than illuminating, they helped people recycle fats!

Waxes are composed of hydrogen (H) and carbon (C) atoms, which means they are hydrocarbons.

Wax and Wane

Beeswax	Bayberry	Soy	Candelilla	Carnauba (Brazilian wax)	Palm	Paraffin
Honeycomb	Berry	Bean	Leaves	Leaves of the palm <i>Copernicia prunifera</i>	Fruit of the oil palm <i>Elaeis Guinensis</i>	By-product of crude oil refining
MP: 145°F PP: 160°F	MP: 116°F 150-165°F	MP: 125°F 130-140°F	MP: 155°F	MP: 180– 187 °F	MP: 195°F PP: 200°F	MP: 99 °F 155-165°F



Distilled vs. Synthesized

Essential Oils

- From plants
- Genuine
 - Unadulterated
 - No natural or synthetic additives
- Authentic
 - From one plant (species-specific)
- Volatile
 - Evaporate (dry-down) very quickly

Synthetic

- Made in a lab by humans
- “Fragrance” oils
- Has “throw” and staying power

Essential Oils

Want to create a custom blend? Pick 2-3 Essential Oils!

Rosemary

Peppermint

Eucalyptus

May chang or
Lemongrass

Basil

Patchouli

Cedarwood

Lavender

Palmarosa or
Geranium

Ylang ylang

Sweet
Orange

How Much Essential Oil?

% of EO for Soy Container Candles: I recommend **7% - 8%**; the *max* amount of EO in your formula should be **10%**.

Candle size in OZ	% of EO in oz (7%)	Amt of EO	# "drops" of EO (rule of thumb is ~20 - 25 drops in an ml)
1 oz	0.07	2 ml	40 drops
2	0.14	4	79
3	0.21	6	119
4	0.28	8	159
5	0.35	10	198
6	0.42	12	238

Temperature Check

Melt Temp

- Literally what temp the solid becomes a liquid
- Challenging with soft waxes like soy or coconut as they become liquid in hot locations

Pour Temp

- You don't want it to harden as you are pouring
- Room temp affects pour temp!
- The pour temp affects the smoothness of the top and the finish/sheen of the candle

Additive Temp

- Must be hot enough to incorporate the additive (think “bond” strength)
- But not too hot to evaporate the volatile oils (NEVER approach boiling Point!)

More on Pour Temp

If room temp is warm, good.



Cold encourages shrinkage; try to work in warm, ambient air.



Buffer cold surfaces such as my cork trivet between the candle container and a stone/cold counter top.

Wicks

Most important part of the candle process!

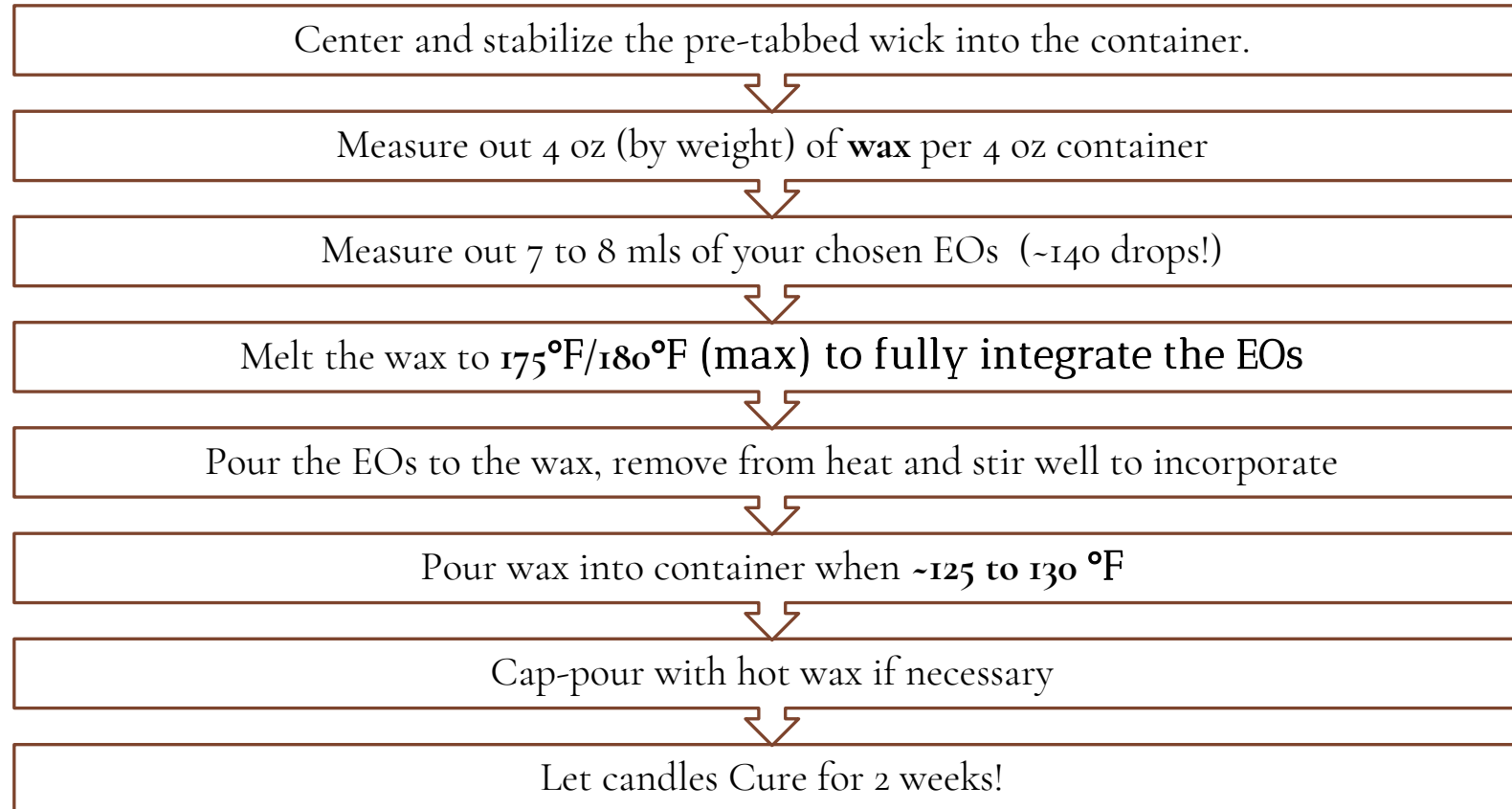
Fuel should burn before the wick

Ratio matters: diameter of mold (pillar)/container dictates the wick size

Follow manufacturers recommendations.

Wick	Candle Diameter
Xsmall	0" – 1"
Small	1" – 2"
Medium	2" – 3"
Large	3" – 4"

Container Candles with Soy



Appendix

More Information as You Make Candles

Wicks

Wick type matters*

- **Flat** wicks
 - Beeswax (but not necessarily containers)
 - Rigid, dipped or self-supporting tapers and pillars
- **Square** braided
 - Beeswax, pillars, containers
- **Cored** wicks are preferable for Soy
 - Zinc, HTP, Cotton cores

**Though it all depends: wax type & candle type (pillar, dipped or container (votive or larger), etc.*

Prime your wick!

- Eliminate air pockets inherent in braiding
- Beeswax: 160 F, dip for 60 seconds

Tips, etc.

To burn:

- Trim the wick to ¼” each time before burning.
- Let the candle wax full come to a liquid pool before extinguishing otherwise the candle will not optimally function over time—so burn for *at least* 30 minutes before extinguishing.

Clean up:

- To get wax out of a jar: put the jar in the freezer
- To get wax out of your pots, etc, set oven to 150 to 160 degrees (F), line a pan with sides (e.g., jelly-roll pan) with aluminum foil, put containers upside down to let the wax drip onto the foil..wipe warm containers out with paper towels.

Color:

- I don't use color, remember that like EOs, they must be soluble in oil/wax

Resources

Candlescience.com

<http://www.lonestarcandlesupply.com> <<<been around since the Internet (as far as I remember)

<https://www.cierracandles.com/>

Fromnaturewithlove.com

Newdirectionsaromatics.com

Bulknaturaloils.com

<https://www.sks-bottle.com/> <<< for containers

<https://glorybee.com/> <<< for beeswax

Many of the above suppliers sell essential oils—out of convenience I often buy essential oils from Whole Foods (the 365 brand) or go to the lovely store <https://www.enfleurage.com/> in Manhattan.