

# History of candle making

**Candle making** was developed independently in many places throughout history.<sup>[1]</sup>



*A close-up image of a candle showing the wick and the various parts of the flame*

Candles were made from whale fat by the Chinese, during the qin Dynasty (221–206 BC).<sup>[2]</sup> In India, wax from boiling cinnamon was used for temple candles.<sup>[2]</sup> In parts of Europe, the Middle-East and Africa, where lamp oil made from olives was readily available, candle making remained unknown until the early middle-ages. Candles were primarily made from tallow and beeswax until about 1850, but subsequently have been made from spermaceti, purified animal fats (stearin) and paraffin wax.<sup>[1]</sup>

## 1 300 - 1 BC

Qin Shi Huang (259–210 BC) was the first emperor of the Chinese Qin Dynasty (221–206 BC). His mausoleum, which was rediscovered in the 1990s, twenty-two miles east of Xi'an, contained candles made from whale fat.<sup>[3]</sup> The word zhú 烛 in Chinese originally meant torch and could have gradually come to be defined as a candle during the Warring States period (403–221 BC); some excavated bronzewares from that era feature a pricket thought to hold a candle.<sup>[4]</sup> The Han Dynasty (202 BC – 220 AD) *Jizhupian* dictionary of about 40 BC hints at candles being made of beeswax, while the *Book of Jin* (compiled in 648) covering the Jin Dynasty (265–420) makes a solid reference to the beeswax candle in regards to its use by the statesman Zhou Yi (d. 322).<sup>[4]</sup> An excavated earthenware bowl from the 4th century AD, located at the Luoyang Museum, has a hollowed socket where traces of wax were found.<sup>[4]</sup>

Wax from boiling cinnamon was used for temple candles in India.<sup>[2]</sup>

Generally these Chinese candles were molded in paper tubes, using rolled rice paper for the wick, and wax from an indigenous insect that was combined with seeds.

Japanese candles were made from wax extracted from tree nuts.

## 2 1 AD - 1500 AD

There is a fish called the eulachon or “candlefish”, a type of smelt which is found from Oregon to Alaska. During the 1st century AD, indigenous people from this region used oil from this fish for illumination.<sup>[2]</sup> A simple candle could be made by putting the dried fish on a forked stick and then lighting it. The first candles to appear in Europe were made by nomadic tribes in the late Roman era, but are thought to have been in use much earlier in the colder climates of Northern Europe, where olive oil was scarce. These early candles were made from tallow, or animal fat. The tallow was put into the melting pot, then poured into molds made of bronze. A trough underneath would catch the excess wax and return it to the melting pot. For the wick, a cord, usually made from the pith of rushes, was suspended from a horizontal rod over the mold when the tallow was poured in. After the fall of the Roman Empire, when olive oil became increasingly scarce, and therefore expensive, the use of tallow can-



*The oldest surviving bees wax candles north of the Alps from the alamannic graveyard of Oberflacht, Germany dating to 6th/7th century A.D.*

dles spread across Western Europe. Later wax candles made from various plant extracts replaced tallow as the preferred source of illumination.

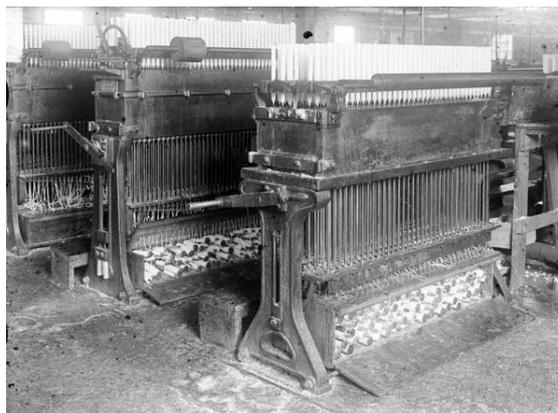
In Africa and the Middle East, candle-making remained relatively unknown due to the availability of olive oil for burning in lamps.

Yak butter was used for candles in Tibet<sup>[5]</sup>

## 2.1 Profession of candle making

Candles were also commonplace throughout Europe. In England and France, Candle making had become a guild craft by the 13th century. These candle makers (chandlers) made candles from fats saved from the kitchen or sold their own candles from within their shops.

During the Middle Ages in Europe, The popularity of candles is shown by their use in Candlemas and in Saint Lucy festivities. Tallow, fat from cows or sheep, became the standard material used in candles in Europe. The Tallow Chandlers Company of London was formed in about 1300 in London, and in 1456 was granted a coat of arms. Dating from about 1330, the Wax Chandlers Company acquired its charter in 1484. By 1415, Tallow candles were used in street lighting. The trade of the



*Candle moulding machine in Indonesia circa 1920*

chandler is also recorded by the more picturesque name of “smeremongere”, since they oversaw the manufacture of sauces, vinegar, soap and cheese. The unpleasant smell of tallow candles is due to the **glycerine** they contain. For churches and royal events, Candles from beeswax were used, as the smell was usually less unpleasant. The smell of the manufacturing process was so unpleasant that it was banned by ordinance in several cities. The first candle mould comes from 15th century Paris.

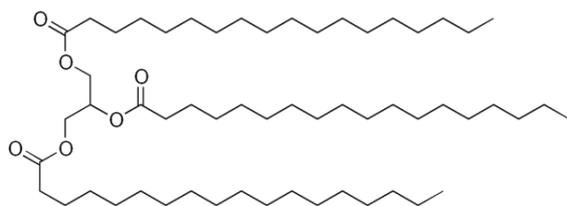
The first American colonists discovered that bayberries could be used to make candles, but the yield was very poor. Fifteen pounds of boiled bayberries would provide only one pound of wax.<sup>[6]</sup>

By the 18th century, the Chinese designed weights into the sides of candles; as such a candle melted, the weights fell off and made a noise as they landed in a bowl.

With the growth of the whaling industry in the late 18th century came **spermaceti**, an oil that comes from **sperm whale**. This feedstock changed candle making since the Middle Ages. Spermaceti was a wax obtained by crystallizing the oil of a sperm whale. It became available in mass quantities. Like beeswax, Spermaceti wax did not evolve a repugnant odor when burned, and produced a significantly brighter light. It also was harder than either tallow or beeswax, so it would not soften or bend in the summer heat. The first “standard candles” were made from spermaceti wax. By 1800, a much cheaper alternative was discovered. **Colza oil**, derived from **Brassica campestris**, and a similar oil derived from **rapeseed**, yielded candles that produce clear, smokeless flames. The French chemists **Michel Eugène Chevreul** (1786–1889) and **Joseph-Louis Gay-Lussac** (1778–1850) patented **stearin**, in 1811. Like tallow, this was derived from animals, but had no glycerine content.

## 2.2 Manufacturing of candles

Joseph Sampson was granted a United States patent for a new method of candle making in 1790 (this was the



Stearin, a purified form of tallow is a major component of many candles.

second patent ever granted by the US).<sup>[7]</sup>

In 1834, Joseph Morgan began to industrialise the production of candles. He created a machine that allowed for continuous production of molded candles by using a cylinder with a moveable piston to eject candles as they solidified. This more efficient mechanized production produced about 1,500 candles per hour which allowed candles to become an easily affordable commodity for the masses.<sup>[8]</sup>

Not until the mid-1850s did paraffin wax become commercially viable, when James Young produced it by distillation of coal.<sup>[9]</sup> Paraffin could be used to make inexpensive candles of high quality. Paraffin wax could also be processed by distilling residue left after crude petroleum was refined. It was a bluish-white wax, burned cleanly, and left no unpleasant odor, unlike tallow candles. Early coal- and petroleum-derived paraffin waxes had a low melting point. The introduction of stearin,<sup>[10][11]</sup> discovered by Michel Eugène Chevreul, solved this problem. Stearin is hard and durable, with a convenient melting range of 54–72.5 °C (129.2–162.5 °F). It was being produced in mass quantities at the end of the 19th century. By this period, most candles being manufactured consisted of paraffin and stearic acid.

Beginning in the mid-nineteenth century, Syracuse, New York developed into a global center for candle manufacturing. Manufacturers included Will & Baumer, Mack Miller, Muench Kruezer, and Cathedral Candle Company.

In the 19th century, candlemakers also began to fashion wicks out of tightly braided (rather than simply twisted) strands of cotton. This technique makes wicks curl over as they burn, maintaining the height of the wick and therefore the flame. Because much of the excess wick is incinerated, these are referred to as “self-trimming” or “self-consuming” wicks.<sup>[12]</sup>

- Hand operated, water cooled, candle making machines
- Candle Factory workshop
- 12” Candles wound out from hand operated machine
- Workers packing candles into boxes

## 2.3 Decline of the candle industry

Despite advances in candle making, the candle industry declined rapidly upon introduction of kerosene and lamps and the 1879 invention of the light bulb. From this point, candles became more of a decorative item.

In 1829, William Wilson of Price’s Candles invested in 1,000 acres (4 km<sup>2</sup>) of coconut plantation in Sri Lanka.<sup>[13]</sup> His aim was to make candles from coconut oil.<sup>[14]</sup> Later he tried palm oil from palm trees. An accidental discovery swept all his ambitions aside when his brother George Wilson distilled the first petroleum oil in 1854. In 1919, Lever Brothers purchased Price’s Candles and in 1922, a joint-owned company called “Candles Ltd” was created. By 1991, the last remaining owner of “Candles Ltd” was Shell Oil Company, who sold off the candle-making part of business.



Candles here are used to celebrate a birthday.

## 2.4 20th Century

As candles started to wane as the major light source due to the introduction of the light bulb, they became more of a decorative item. Candles became available in a broad array of sizes, shapes and colors, and consumer interest in scented candles began to grow. During the 1990s, new types of candle waxes were being developed due to an unusually high demand for candles. Paraffin, a by-product of oil, was quickly replaced by new waxes and wax blends due to rising costs. Candle manufacturers looked at waxes such as soy, palm and flax-seed oil, often blending them with paraffin in hopes of getting the performance of paraffin with the price benefits of the other waxes. The creation of unique wax blends, now requiring different fragrance chemistries and loads, placed pressure for innovation on the candle wick manufacturing industry to meet performance needs with the often tougher to burn formulations.<sup>[15]</sup>

## 3 References

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