



# Bees wax

Presented by Olivier Pingot



# What is beeswax?

Lipidic in nature.

Contains saturated hydrocarbons, acids or hydroxy acids, alcohols, pigments mainly from pollen and propolis, as well as substances from brood, etc.

Solid body at room temperature, brittle at low temperature  $<18\text{ }^{\circ}\text{C}$  but rapidly becoming plastic around  $35\text{-}40\text{ }^{\circ}\text{C}$ .

Its melting point is around  $65\text{ }^{\circ}\text{C}$ .

Its density is approximately 0.95.

Beeswax is a complex product, wax includes several hundred compounds, including:

- Esters of fatty acids and alcohols: 70%
- Acids: 14%;
- Hydrocarbons: 12%;
- Alcohols: 1.2%;
- Lactones: 0.5%;
- Water and other substances: 2.3%.



# How beeswax is produced?

Produced by the wax glands of the bee.  
Used to build the cells that contain honey, pollen and brood.  
Workers have 8 wax glands located on the inner part of abdomen segments 4, 5, 6 and 7.  
Wax glands activity varies with the age of the worker : maximum development around the 12th day after birth and begin to decrease from the 18th or 19th day until the bee dies.

The wax scales produced are chewed by the mandibles. The bee then incorporates a solvent of salivary origin into it, which makes it easier to mix. Thus crushed, the wax scale is used in the construction of the comb or is used to seal the cells filled with honey.



Wax scales under worker abdomen



Wax is white when produced

# How beeswax is produced?

Wax production depends on **food availability**. However, bees can build cells and seal their larvae in the absence of honey by reusing materials taken from already built combs.

**To produce 1 kg of wax, bees need 6-7 kg of honey!**

Wax is also used to **cap honey cells**. Bees cap honey in groups. Italian bees tend to leave a pocket of air between the honey, hence the white aspect, instead of capping directly on honey.

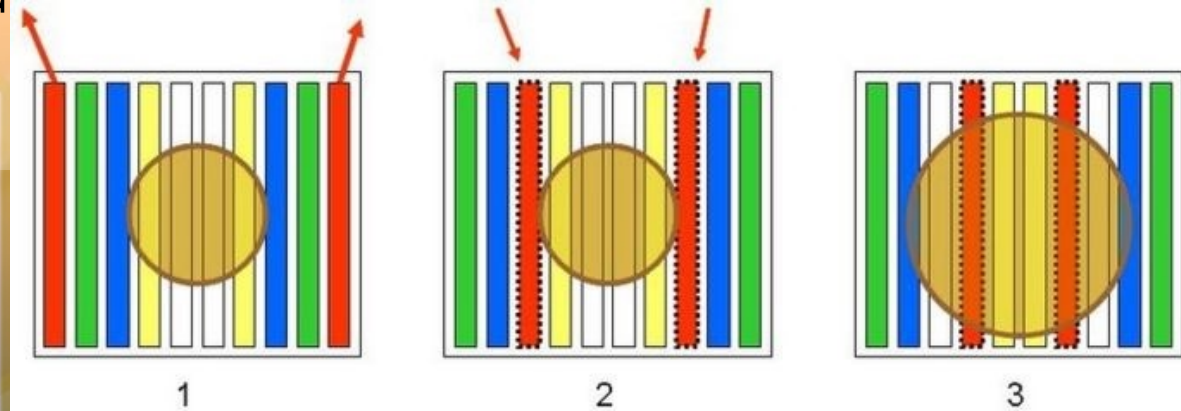


Wet and dry capping

# Why renew wax and frames?

Frame renewal is very important for 3 reasons:

- hygienic the annual renewal of some of the crooked or older frame is necessary. Pathogens, spores and fungi find in old frames/wax an ideal breeding ground.
- Brood cells become smaller, therefore give birth for smaller bees with shorter lifespan.
- Helps to combat swarming. When nurses run out of young larvae to rear, they accumulate fat, and if they have no more frames to build they promote swarm behaviour.



Frame rotation scheme

# How to process wax?

## Wax melting

### ➤ Preferred way: **Solar melting**

Box with a window painted inside in black

Pro: very safe, inexpensive, doesn't overheat wax, separate wax from "coccon", dry method,...

Con: need a sunny day, need to turn the wax melter in direction of the sun, slow (1 or 2 frames each time)

### ➤ Second preferred way: **Wet method**

Mix the wax to process with water and boil or use a water bath.

Pro: can be done anytime, doesn't overheat, can be done in a kitchen.

Con: messy, needs post-processing and filtering, water bath are very expensive, long cleaning process, ...



My solar wax melter



Double jacket water bath melter

# How to process wax?

## Wax melting

Alternative: **Oven/microwave melting**

Pro: relatively quick, can be done anytime.

Con: No temperature control, can burn the wax therefore darken it, can ignite if too hot, dangerous to handle



# How to process wax?

## Post processing

Often, your first melt still contains a lot of debris. Depending on the purpose of your bees wax, a filtration process is needed.

## Filtering

Prefred way: stainless steel sieve + fine cotton cloth.

Remelt your wax with a water bath then pour through the fine cotton in the sieve into a wax mold or any other mold (metal, silicon, cup, food container,...)

If the wax is very dirty, then filter it through a cooking oil filter before doing a second quality filtering.

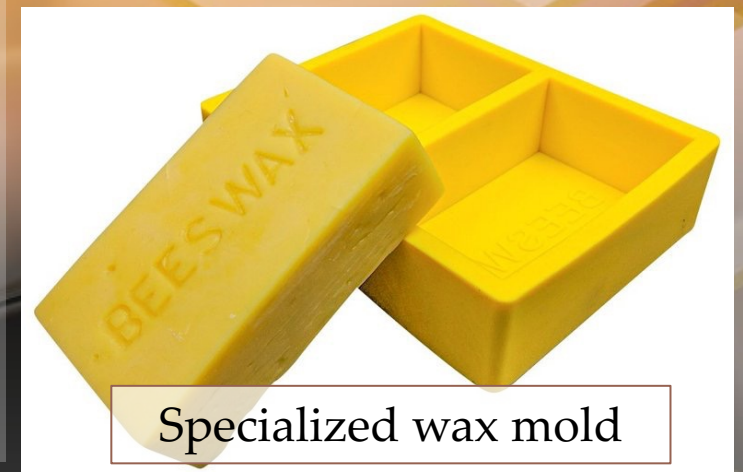
Links : [Holder](#), [paper](#)



Cooking oil filter paper



Improved water bath



Specialized wax mold



# How to process wax?

## Post processing

### Royal easter show wax quality

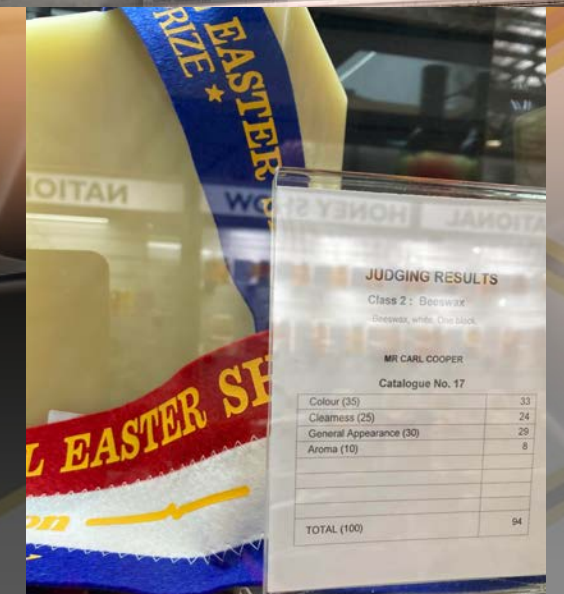
- Clearness (absence of residues)
- Color
- General appearance (No cracks)
- Aroma

### How to achieve perfection?

- A good filtration through a jersey cotton cloth will clean perfectly any wax.
- A pale color is achieved by either using only fresh wax, or fresh cappings OR crushing your coloured wax and let it sit under the sun for days (it will turn naturally the wax white).
- A very slow and uniform cooling will get you an uncracked block.
- Finally, honey capping and low wax melting process keeps the natural fragrance of the wax.



Wax block



JUDGING RESULTS	
Class 2: Beeswax	
MR CARL COOPER	
Catalogue No. 17	
Colour (35)	33
Clearness (25)	24
General Appearance (30)	29
Aroma (10)	8
TOTAL (100)	94

# Use of bees wax

Wax making use a lot of energy from the bees and therefore is a valuable product. What are the possible use of beeswax?

## Exchange for new wax foundation

Tobin and Son in Raglan (next to Bathurst) will take your wax and exchange it for foundation with only the process fee (\$7 per kg) instead of \$26.85 per kg.

1 box of 180 sheets weight 14 kg

1 box cost more than \$500 now.

## Candle making

Beeswax candle are beautiful and burn with a nice smell. They also produce a lot of heat without black smoke.

To make candle you need a good cotton wick and a very pure beeswax, otherwise the impurities will clog the wick and the candle will go out.



Bees wax candles

# Use of bees wax

## Beauty products: lip balm and cream

Australian bees wax is renowned for its purity (no chemical residues) compared to other bees wax in the varroa mite world. It's sought after for lip balm making and cosmetic cream.

### Lip balm recipe

1/4 cup **beeswax** block, grated

1/4 cup shea butter

1 tbsp coconut oil

Few drops of essential oils of your choice (peppermint or other)

### Hand cream recipe

1 tablespoon of honey

8 tablespoons of grated beeswax

200 ml of sweet almond oil

1/2 cup rose water



# Use of bees wax

## Bees wax wrap

Bees wax wrap are very popular as they replace harmful plastic wrap and are reusable.

They are fairly easy to make.

What you need:

- Electric fry pan
- Purified bees wax
- Square of organic cotton or non organic cotton, new or recycled from an old shirt
- Pair of tweezers or tongs

Quick and easy method:

- Melt the wax in the electric fryer
- Place the piece of fabric inside with the tongs
- Soak completely the fabric
- Remove and allow dripping over the frypan for a minute or two



Banquet Frypan



# Use of bees wax

## **Furniture polish – Shoes polish**

Furniture polish or French style polish is easy to make.  
All you need is vegetable oil (olive) and beeswax

- 150g (2/3 cup) of beeswax
- 600g (3 cups) of olive oil or orange seed oil or walnut oil (eucalyptus oil can also be used BUT not for food grade waxing)
- 30 drops Anti-oxidant *such as clear Grapefruit Seed Extract or Vitamin E* (optional)
- 10 drops Essential oil, your choice (optional)

## Leather shoe polish

Melt bees wax and vegetable oil (olive, walnut, coco,...)  
Add a bit of Vaseline for waterproofing

[Link](#)



# Use of bees wax

## Art and craft

Wax has been used since the dawn of time for different use and also for paint, sculpture, metal cast making, wax pens,...  
Some artists use bees wax to make artwork



Ren Ri

[Link](#)

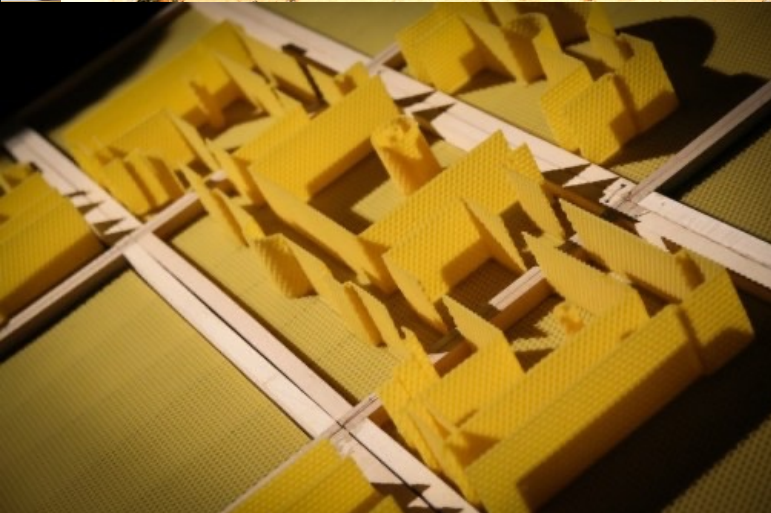


# Use of bees wax

Art and craft

Luce Moreau

[Link](#)



# Use of bees wax

Art and craft

Tomáš Libertíny

[Link](#)

[Link](#)





# Use of bees wax

Art and craft

Julie Williams

[Link](#)

[Link](#)



Julie uses hot wax on strips of hand made paper then dips them in natural indigo and let the blue ink dye the paper not protected by the wax.

Thank you



20. maj **SVETOVNI DAN ČEBEL**  
20 May **WORLD BEE DAY**



Merci