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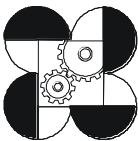
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# SOAP TECHNOLOGY



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***‘Our Business is Industry...’***

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# **MAKE SOAP FROM COCONUT OIL (Cold Process)**

## **INTRODUCTION**

Soap is the sodium salt of a fatty acid resulting from the chemical reaction of fats and alkali. Fats and oils are primarily triglycerides, that is, a molecule of glycerol linked up with three (3) molecules of fatty acids. The triglyceride is broken down during saponification with alkali to glycerol and fatty acids; the latter combining with the sodium in the alkali to form soap molecules.

Coconut oil soap is a well-known commercially established product. The coco-oil is considered as an ideal raw material for soap manufacture due to its hardness, ready stability and free lathering properties of the Na soaps made with it. Furthermore, this oil is easily saponified, even in the cold, so that cold process soaps maybe made with it, a simple process adoptable on the farm or in rural coconut community.

A simple cold process of soap making involves the reaction of the oil with a quantity of strong caustic alkali solution almost equivalent to that theoretically required for complete saponification. This process needs quite simple equipment and little skill in operation.

## A. PREPARATION OF LAUNDRY SOAP

### Materials/Ingredients (for 28 bars)

|   |         |
|---|---------|
| Coco oil                                    | - 8 kg  |
| Caustic soda solution, 36°Be [30% solution] | - 5 kg  |
| Soda ash                                    | - 90 g  |
| Salt  | - 48 g  |
| Sodium silicate                             | - 400 g |
| CDEA [coco diethanolamide]                  | - 40 mL |
| Citronella oil                              | - 20 mL |
| Water                                       | - 6 L   |

### Equipment/Tools

Plastic pail – 16 L cap. [2]; 20 L cap. [1]  
Hydrometer, 0-70°Be  
Weighing scale – 10 kg  
Wooden stirrer/manual or electric mixer  
Moulder  
Cutter  
Spatula, stainless  
Basin (large)  
Graduated cylinder

### Preparation of Materials

#### Caustic soda solution, 36°Be (30% solution)

Dissolve 2 kg caustic soda in 4.6 liters water. Cool to room temperature, check the concentration with the hydrometer, adjust (if necessary) and filter if needed before using.

#### Additives

Dissolve salt, soda ash and sodium silicate in 1.4L of water.

### Preparation of the Soap

1. Measure or weigh carefully the required quantity of coco oil.

2. Weigh the lye or caustic soda solution required (5 kg) and add slowly to the oil, stirring continuously for about 30-45 minutes until it attains the condensed milk-like consistency.
3. Add the measured amounts of dissolved additives and CDEA (foam booster) with continuous stirring from 5-10 minutes more. Then add the essential oil with stirring. Stop stirring when the mixture attains a viscosity similar to condensed milk.
4. Pour the homogenous viscous soap mixture into the moulder, allow to set at room temperature for 12 hours or until soap solidifies.
5. Cut the soap into bars of suitable sizes with a string or wire attached to the wooden/metal cutter. Twenty-eight (28) bars will be produced. The soap is white or creamy white. Cut bar into 4 pieces and pack in a plastic bag.
6. Allow to age from 7 to 10 days to complete the saponification reaction.

## **B. PREPARATION OF TOILET SOAP/BATH SOAP (OPAQUE)**

### **Materials/Ingredients (for 14 bars, 135 g/bar)**

|                                    |           |
|------------------------------------|-----------|
| Refined coconut oil                | - 4.5 kg  |
| Caustic soda solution (32°Be)      | - 3.25 kg |
| EDTA (Ethylene diaminetetracetate) | - 70 g    |
| Citric acid                        | - 70 g    |
| Sodium chloride                    | - 4.5 g   |
| CDEA (Coco diethanolamide)         | - 50 g    |
| Glycerol/glycerine                 | - 70 g    |
| Scent to suit                      |           |
| Color (optional)                   |           |

## Equipment/Tools

Pails – 16 L cap. (2); 20 L cap. (1)  
Basin (large)  
Hydrometer – 0 – 70°Baume  
Weighing scales – 10 kg cap.; 500 g cap.  
Mold and cutter  
Wooden stirrer/manual or electric mixer  
Spatula, stainless

## Preparation of Materials

### 1. Caustic soda solution, 32°Be

Dissolve 1.0 kg of caustic soda (NaOH) in 2.8 kg water. Cool to room temperature. Check the concentration with the hydrometer. Adjust if necessary and filter if needed before using.

### 2. Additives

Dissolve EDTA, citric acid and salt in 100 mL water. For color, make a 1% solution. Add color in oil.

## Preparation of the Soap

1. Weigh carefully the required quantity of coco oil. To make a colored soap, add about 10 mL of the 1% color in oil solution or the amount to suit the desired intensity of color.
2. Add the required amount of caustic soda with stirring until the condensed milk-like consistency is attained. This usually takes 45 minutes to 1 hour.
3. Add the dissolved additives and continue stirring for 5 minutes more.
4. Add the glycerol, CDEA and scent. Stir for another 5 minutes.
5. Pour the soap mixture into the moulder. Let it stand at room temperature for 12 hours or until soap solidifies.



6. Remove soap from the moulder and cut into desired size.
7. Stamp and pack. Allow to age for about 7 days to complete the saponification.

### **Preparation of the Soap with Herbal Additive**

1. Follow procedure for Opaque Bath Soap (steps 1-4).
2. Add herbal extract.

#### ***Preparation of fruit/vegetable extract:***

1. Using blender – blend with enough water and filter thru cheesecloth.
2. Using grater – grate with fine grater and squeeze juice with cheesecloth.
3. Juice extractor – strain juice thru cheesecloth.

#### ***Usage:***

For one bath of basic formulation, add

1. 250-300 gms fruit or vegetable extract
2. 250-300 gms dry additives (ex. Oatmeal, leaf powder, etc.)

## **C. BATH SOAP (TRANSPARENT) WITH HERBAL EXTRACT**

### **Materials**

|                               |         |
|-------------------------------|---------|
| Coconut oil                   | - 100 g |
| Stearic acid                  | - 100 g |
| Castor oil                    | - 80 g  |
| Caustic soda solution (38°Be) | - 160 g |
| Glycerol                      | - 85 g  |
| Alcohol                       | - 100 g |
| Sugar                         | - 80 g  |
| Water                         | - 80 g  |

CDEA  
Perfume (optional)

25 g

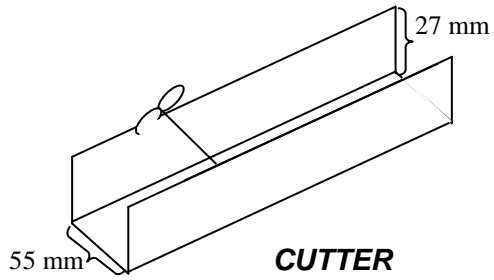
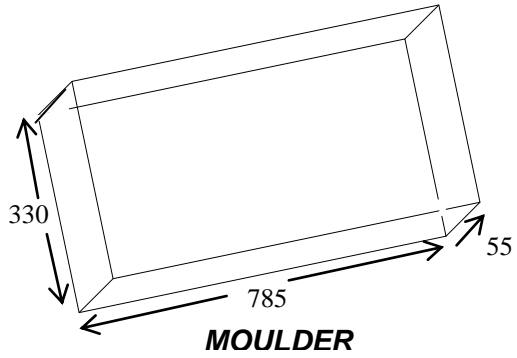
### **Preparation of 38°be caustic soda**

Dissolve 1 kg caustic soda in 2 liters of waters. Cool to room temperature. Measure the concentration with a hydrometer. Adjust (if necessary) and filter if needed before using.

### **Procedure**

1. Weigh all the ingredients.
2. Melt separately the stearic acid and coconut oil at 80°C.
3. Add castor oil first before adding lye into the charge oil.
4. Mix caustic soda with alcohol; add slowly to fat charge with stirring. Temperature should not exceed 75°C.
5. Add herbal extract and stir for 5 minutes.
6. In a separate container, dissolve sugar in water at 80°C (remove any froth).
7. Add to the soap mass, the glycerol, the water-sugar solution, and the CDEA stirring constantly.
8. Cover and allow to stand until temperature reaches 60°C, add perfume and color (if needed).
9. Transfer to mould or frame.

**NOTE: Rapid cooling is essential for soap transparency.**



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