

Manually Calculating the Lye Needed to Make Soap

You can manually calculate the amount of lye needed to make your soap. Even though we have easy access today to accurate Soapmaking calculators, it is always good to know how to quickly check a soap formula. All you need to know is the oil variety, the amount used, and its SAP value. The rest is easy math, even easy for those that hate math!

When you look at a Sap Value chart you will see a decimal number in front of the number, this is your SAP value for that unique oil. **The SAP value shows you the amount of lye that is needed to fully saponify 1 oz of that particular oil.**

Step 1: Create your soap formula. Choose the oils and the amounts you would like to use. Below is a basic Trinity Formula that has been modified to include a butter and some castor oil.

24 oz Olive Oil
16 oz Coconut Oil
16 oz Palm Oil
4 oz Shea Butter
2 oz Castor Oil
62 oz combined soap oils

Step 2. Next Find the SAP value for each of the oils or butters. Often you can simply Google, ex: "Olive, SAP value" if you can not find a SAP value chart.

Olive Oil, **SAP value .134**
Coconut Oil, **SAP value .190**
Palm Oil, **SAP value .141**
Shea Butter, **SAP value .128**
Castor Oil, **SAP value .128**

Step 3. Now you will use basic multiplication to find out how much lye each individual oil requires to fully saponify. We will later calculate to make this batch have a 5% superfat. Simply take the SAP value for an oil and multiply it by the number of ounces your formula requires for that oil.

24 oz Olive .134 x 24 = 3.216 oz lye needed
16 oz Coconut .190 x 16 = 3.04 oz lye needed
16 oz Palm .141 x 16 = 2.256 oz lye needed
4 oz Shea .128 x 4 = .512 oz lye needed
2 oz Castor .128 x 2 = .256 oz lye needed

Step 4. Now you have five multiplication totals. We will now sum those five totals into one grand total:

3.216 + 3.04 + 2.256 + .512 + .256 = 9.28 oz total lye needed to fully saponify the combined 62 oz soap oils.

Step 5. The 9.28 oz of lye is what will make perfectly saponified soap, but it will not be very moisturizing. To make this batch of soap more skin loving we will now do a final calculation to reduce the lye by 5%, or what is referred to as a "Lye Discount". This lye discount is the same thing as superfatting, only we are building it in to the formula at the beginning. A 5% lye discount is recommended because both lye quality can vary slightly as well as SAP values are merely averages for each oil. Oil SAP values can drift or change slightly due to season, location, and various other external environmental conditions such as drought. That 5% lye discount ensures that your soap has a safe margin and does not end up lye heavy. Since we want to discount this lye amount by 5%, we multiply the amount of lye by .95:

9.28 oz lye x .95 = 8.816 oz lye needed for a 5% lye discount/superfat.

When rounding, always round UP.

8.816 oz would round up to 8.82 oz of lye for that 62 oz oil blend, superfatted at 5%

If you want to superfat at 10%, you would multiply the weight of your lye by .90, using only 90% of the lye needed.

If you want to superfat at 8%, you would multiply the weight of your lye by .92, using only 92% of the lye needed.