

Soapy Stuff: Water in soap

classicbells.com/soap/waterRatioConc.html

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Lye concentration versus Water:lye ratio

Lye Conc., %	Water:Lye Ratio	Suggested usage
25	3.00	The most water in proportion to alkali that is typically used for soap. Good for making liquid soap paste, shave soap, or hot process (HP) bar soap. Not recommended for cold process (CP) soap. CP soap with this much water may not form a stable emulsion and may separate in the mold. It is very likely to be far too soft for days after saponifying.
26	2.85	
27	2.70	
28	2.57	Lowest lye concentration I recommend for cold process (CP) bar soap. Pros: Good for recipes high in coconut oil that can overheat and crack. May work better for complicated swirls, depending on the soaper and the recipe. Cons: Soap is more likely to gel during saponification, which you may or may not want. Soap is more likely to show streaking and mottling (aka glycerin rivers). Higher chance of emulsification failure and separation in the mold. Soap may take several days to firm up enough to be removed from the mold.
29	2.45	
30	2.33	
31	2.23	
32	2.13	
33	2.03	Good all-around choice for most CP recipes and many CP soap makers. Pros: Chance of gelling and "glycerin rivers" is reduced but may sometimes happen. Soap gets firmer in the mold faster. Cons: Soap may trace somewhat faster than with more water, but this is not a hard-and-fast result. The time to trace also depends on the fats and your soaping methods.
34	1.94	
35	1.86	
36	1.78	
37	1.70	
38	1.63	

39	1.56	
40	1.50	Good choice for 100% olive oil soap and other slow saponifying recipes. Pros: Chance of gelling and "glycerin rivers" is very low. Other pros and cons are same as for 33% lye concentration (2.03 water:lye ratio).
41	1.44	
42	1.38	
43	1.33	
44	1.27	
45	1.22	
46	1.17	
47	1.13	
48	1.08	
49	1.04	
50	1.00	The lowest amount of water in proportion to alkali that can be used. Any soap recipe can be made with a 50% lye concentration, but most soapers prefer to use more water. This is the most NaOH or KOH that will dissolve in water at room temperature.

More about Water:Lye Ratio

This ratio is the weight units of water used for every 1 weight unit of lye.

The "lye" in the water:lye ratio can be NaOH or KOH or a mixture of both alkalis.

The weight units can grams or ounces or any other unit of weight. Just be consistent -- don't mix grams with ounces!

Some examples --

Water:lye ratio of 1.50 means there are 1.5 grams of water for every 1 gram of alkali.

Water:lye ratio of 2.33 means there are 2.33 grams of water for every 1 gram of alkali.

If you prefer ounces, substitute "ounce" wherever you see "gram" in these examples.

Because the lye weight is always "1," this "1" is not always shown, such as in this table, but sometimes the "1" is shown. For example, you might see a water:lye ratio of 1.5 that looks like these examples --

1.5:1

1.5 to 1

1.5/1

The math behind this table

Convert lye concentration to water:lye ratio --

$$\text{Water:Lye Ratio} = 100 / \text{Lye concentration \%} - 1$$

Example: The lye concentration is 30%. What is the water:lye ratio?

$$\text{Water:Lye Ratio} = 100 / 30 - 1 = 3.333333 - 1 = 2.33 \text{ (answer rounded to 2 places)}$$

Convert water:lye ratio to lye concentration --

$$\text{Lye concentration \%} = \text{Lye weight} / (\text{Lye weight} + \text{Water weight}) \times 100$$

Example: The water:lye ratio is 1.5, meaning 1.5 parts water to 1 part lye. What is the lye concentration?

$$\text{Lye concentration \%} = 1 / (1 + 1.5) \times 100 = 1 / 2.5 \times 100 = 40\%$$

Learn more

To learn more about choosing the right amount of water for your soap recipe, see "[Full water and other drippy myths](#)"

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