Saponification & INS Table

Saponification Formula

1. Oils are composed of fatty acids which require a certain amount of an alkali (lye) to saponify them, or change them into soap.
2. Use the chart below to find the saponification value of your chosen oils and then fill in the following equation to figure out how much lye you need for your soap recipe.
3. Equation: Oil (in oz. or grams by weight) x SAP value* (from chart below) = Amount of lye needed
   - Example: Olive 60 oz x .1340 = 8.04
4. If you are using more than one type of oil in a single recipe, do Step 3 for each oil and total your results together to get the total amount of lye needed.
5. *Use Sodium Hydroxide (NaOH) column for bar soaps and Potassium Hydroxide (KOH) column for liquid soaps

INS Formula

- INS Value (ratio of iodine and saponification values). Used to evaluate ratio of oils in your recipe.
- Ideal average INS value for a fat/oil mixture in a recipe is 150-160.
- Use the chart below to find the INS Value of your chosen oils and then fill in the following equation to figure out the total average INS value for your recipe.
- Equation: % of oil/fat x INS value. Total all oils.
- Example: 30% Coconut x 258 = 77.4 ; 35% Olive x 109 = 38.15; 10% Soy x 61 = 6.1; 25% Beef Tallow x 147 = 36.75
- Total of all values: 77.4 + 38.15 + 6.1 + 36.75 = 158.4 (Total INS Value)

Oil	SAP VALUE		INS VALUE
	NaOH	KOH	
Almond, Sweet	.1360	.1904	97
Beeswax	.0670	.0940	84
Canola	.1240	.1736	56
Castor	.1286	.1800	95
Cocoa Butter	.1370	.1918	157
Coconut	.1900	.2660	258
Corn	.0360	.1904	69
Cottonseed	.1386	.1940	89
Grapeseed	.1290	.1810	66
Lard	.1380	.1932	139
Linseed	.1357	.1899	12
Olive	.1340	.1876	109
Palm	.1410	.1974	145
Peanut	.1360	.1904	99
Safflower	.1360	.1904	47
Sesame Seed	.1330	.1862	81
Shea Butter	.1280	.1792	116
Shortening (veg)	.1360	.1904	115
Soybean	.1350	.1876	61
Sunflower Seed	.1340	.1876	63
Tallow, Beef	.1405	.1967	147