

FULL IMMERSION DYEING WITH FIBER REACTIVE DYES CALCULATING THE AMOUNT OF DYE, SALT, SODA ASH, WATER TO USE

WOF

Document the **weight of fiber** (dry) to be dyed in grams.

example: 370 grams

AMOUNT OF DYE TO USE

Depth of Shade (DOS) = amount of dye in grams used to dye 1 gram of fiber, expressed as percentage. Example: 3% depth of shade (dos) = .03 grams of dye per 1 gram of fiber or 3 grams of dye per 100 grams of fiber.

1. Decide on the depth of shade (dos) desired. Calculate the correct volume of stock solution to use in your dyebath using this formula (we will be using 4% stock solution in class):

(depth of shade % x weight of fiber in grams) ÷ strength of stock solutions % = volume of stock solution to use in the dyebath

Value/Shade	Depth of Shade as a Percentage
Pastel	0.125% - 0.5%
Pale	1% - 3%
Medium	3% - 5%
Dark	5% - 8%
Black	8% - 12%

example:

(5% depth of shade x 370 grams) ÷ 4% stock solution = 462.5 ml of stock solution
(.05 x 370) ÷ .04 = 462.5 ml

2. Find the color recipe, translate parts into percentages, and calculate the volume of stock solution to use for each single hue dye (using a 4% stock solution):

example of color recipe from <https://tienchiu.com/dye-samples/procion-mx-on-cotton/sun-yellow-mixing-red-mixing-blue/>:

Sun Yellow (ProChemical&Dye)/ Lemon Yellow (Dharma Trading Company)	0.5 part
Mixing Blue (ProChemical&Dye)/ Cobalt Blue (Dharma Trading Company)	2 parts
Mixing Red (ProChemical&Dye)/ Light Red (Dharma Trading Company)	1.5 parts

4 parts ----- 100%	
0.5 part ----- x	x = 12.5%

Lemon Yellow:	(12.5%)	= 58 ml of 4% stock solution
Cobalt Blue:	(50%)	=231 ml of 4% stock solution
Light Red	(37.5)	=174 ml of 4% stock solution

AMOUNT OF WATER

20 x WOF (weight of fiber)

example: 20 x 370 grams = 7,400 grams (ml)

SALT

Salt allows the dye to distribute more evenly throughout the dye-bath. Use 0.5 grams of salt per gram of fabric

example: 370g fabric x 0.5 = 185g salt

SODA ASH

Soda ash Soda ash activates the dye. Without soda ash, Procion mx dyes are not wash or light fast and the color will not turn out as desired. Use 0.09 grams of soda ash per gram of fabric

example: 370g fabric x 0.09 = 33.3g soda ash