

**Immersion Dyeing using WashFast Acid Dyes –  
Using 1% Dye Stock Solutions**

**Depth of Shade (DOS)** refers to the ratio of dye powder to dry fiber weight. For 100 grams of dry fiber, 1 gram of dye powder equals 1% of the dry fiber weight. 1% DOS for 100 grams of fiber = 1 gram of dye powder.

**Stock Solutions** make it much easier to measure out dye by pre-mixing the dye powder with a precise amount of H<sub>2</sub>O. Our class's Stock Solutions are made at 1% DOS (depth of shade): 1 grams of dye powder per 100 mL of water. Therefore, for 100 grams of fiber (dry weight) uses 100 mL of 1% stock solution for a 1% DOS.

**Depth of Shade (DOS) for Wool and Silk**

Light pastel shade = .5% DOS (for 100g of dry fiber use .5g dye powder or 50 mL stock solution)

Medium shade = 1% DOS (for 100g of dry fiber use 1g dye powder or 100 mL stock solution)

Deep shade = 2% DOS (for 100g of dry fiber use 2g dye powder or 200 mL of stock solution)

Very Dark or Black = 3-4% DOS (for 100g of dry fiber use up to 3-4g dye powder or 300-400 mL of 2% stock solution)

Note: Double the DOS above for dyeing Nylon.

**Equations**

**Desired DOS** \_\_\_\_\_ / **DOS % of Stock Solution** 1 = **factor** \_\_\_\_\_

example: *Desired DOS* 1.5% / *DOS % of Stock Solution* 1% = *factor* 1.5

DYE 1:f Ratio \_\_\_\_\_ g Fiber x **factor** \_\_\_\_\_ = \_\_\_\_\_ mL stock solution

H<sub>2</sub>O 1:40 Ratio \_\_\_\_\_ g Fiber x 40 = \_\_\_\_\_ mL H<sub>2</sub>O (1000mL=1 Liter)

Salt 1:1/2 Ratio \_\_\_\_\_ g Fiber x .5 = \_\_\_\_\_ g Salt

Fixer 1:1/6 Ratio \_\_\_\_\_ g Fiber x .15 = \_\_\_\_\_ g Citric Acid

**The Procedure**

**Step 1: Weigh** your dry fiber to be dyed. Weight of Fiber: \_\_\_\_\_ grams

**Step 2: Wet out your fiber** by measuring ½ tsp (2.5ml) Synthrapol in roughly 2 ½ gallons (10 liters) of hot water per 500 gm of fabric. Soak for at least 30 minutes.

**Step 3: Measure your stock solution dye amounts.**

Color A \_\_\_\_\_ amount \_\_\_\_\_ mL

Color B \_\_\_\_\_ amount \_\_\_\_\_ mL

Color C \_\_\_\_\_ amount \_\_\_\_\_ mL

Color D \_\_\_\_\_ amount \_\_\_\_\_ mL

Total amount of dye \_\_\_\_\_ mL

**Step 4: Make the dye bath** in a stainless steel pot.

Add water: \_\_\_\_\_ liters

Add salt: \_\_\_\_\_ grams

Add Synthrapol (1 tsp)

Add dye

Add the Fixer (Citric Acid): \_\_\_\_\_ grams

**Step 5: Add the Fiber.** Squeeze-out the excess water from your fiber and then add it to the dye pot.

**Step 6: Raise the temperature** to 205 F (96 C). (180 F for silk)

**Step 7: Keep at temperature** and stir frequently for the next 30-60 minutes. The darker the color, the longer the dyeing time. The dye should exhaust, meaning the water becomes clear. (If it doesn't after 60 min, use less dye next time)

**Step 8: Cool down.** Allow the dye bath to cool to room temperature for at least 30 minutes or overnight (preferred). More dye will fix while cooling.

**Step 9: Wash out fiber.** Remove fiber and rinse it well in warm water. Wash with ½ tsp of Synthrapol per 500 gm of fabric. Rinse until water runs clear.