

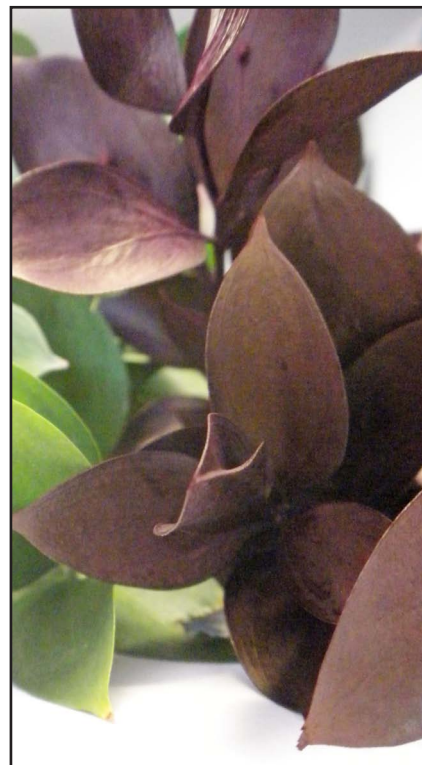
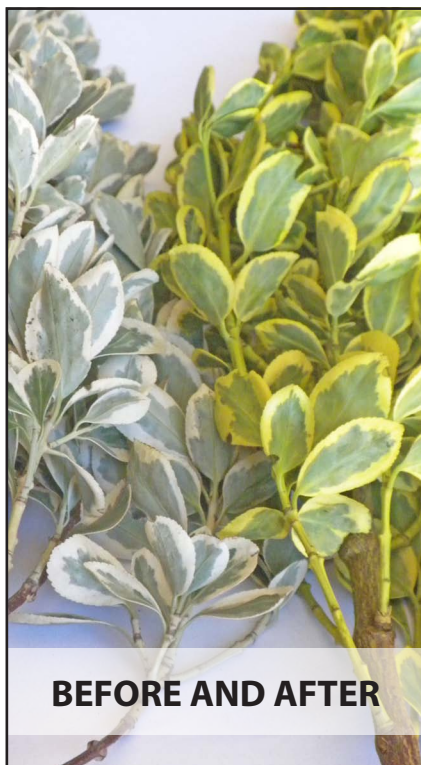
ROBERT KOCH Industries, Inc.

Dyes • Pigments • Fragrances • Specialty Products

DYEING FRESH CUT FOLIAGE BY IMMERSION WITH BASIC DYES

Reference Sheet #201

web version 2.0



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KOCH COLOR



INTRODUCTION

STEP 1 **Preparing the Dyebath**

Basic dyes may be used to dye select fresh cut foliage. The process involves immersing the foliage in a solutions of hot water and dye. Basic dyes are often used in the floral and craft industry to dye dried flowers, bamboo, raffia, berries etc. by immersion. This process can be modified for use with certain cut foliages.

Significant caution must be taken to ensure that the resulting product has sufficient color fastness and vase life. The foliar surface of leaves and stems is covered with a thin, protective, waxy layer called the cuticle. This layer is essentially impervious to water and must be broken down in order for the dye to penetrate.



Waxy cuticle prevents water from seeping into the leaf

This is usually accomplished by heating the water to a point where the wax begins to melt. A minimum temperature of 160°F (71°C) is usually necessary. Below this temperature, dye transfer to the foliage is merely a surface staining of the cuticle layer. Color fastness is poor and coloration is non-uniform. As the temperature of the dye solution increases, the cuticle breaks down and the rate of dye diffusion into the plant fiber increases. A dyebath temperature of 180°F (82°C) is customary.



For smaller scale production and testing, a food warmer tray can be used as a dye tank.

STEP 2 **Adding Dye**

The process involves first dissolving the basic dye (Koch Color 8000 series immersion dyes) in very hot water. The dye concentration required will vary considerably depending on the shade desired. Light colors require lower dye concentrations than intense colors. Typical concentrations vary from 1/10 to 1/2 ounce per gallon (0.75 - 3.75 grams per liter).



Add desired amount of dye and stir until dye is dissolved.

STEP 3 **Wetting Agent**

A small amount of a nonionic wetting agent (TW-80) can be added to help promote uniform color distribution on the foliage. A use rate of 3/4 teaspoon per gallon (1 ml/l) is sufficient.



Add surfactant and stir

After the dyebath has been prepared the foliage is immersed just long enough to break down the cuticle and fix the dye onto the plant fiber. This generally takes from 30 seconds to one minute.

STEP 4 **Immerse Foliage**

If the foliage is immersed in the hot dyebath too long, physical damage to tender foliage can occur, resulting in a reduction in vase life. The dye process is thus a delicate balance between dye fixation and vase life. Therefore this process is only suited for hardy foliage that can undergo this treatment.

STEP 4 cont. **Immerse Foliage**

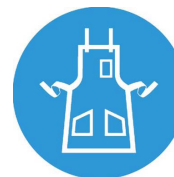
Generally, only the top 2/3 of the foliage is dyed. For best results, do not dye the bottom portion of the stems. This greatly reduces chances that dye could bleed into vase water and also avoids damaging vascular tissue, facilitating subsequent rehydration.



Immerse top 2/3 of foliage completely in dyebath. Do not dye bottom portion of stems.

Safety Precautions

Personal care also needs to be taken to avoid burns. Employees should wear long rubber gloves suitable for high temperatures. Other protective clothing may include a heavy-duty apron, safety glasses and rubber boots. If splashing may occur, a face shield is advisable.



STEP 5 **Rinse Foliage**

After dyeing it is necessary to rinse the dyed foliage in cool water. This removes unfixed dye and cools the plant surface. This step is important because it reduces the potential that the dyed foliage will stain customer's hands and / or exhibit color bleed when in contact with water.



Rinse foliage in cool water

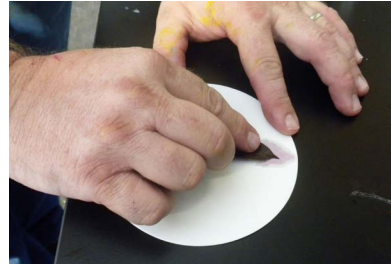
The intensity of the color will decrease slightly after rinsing. This is normal. If too much color is removed during rinsing, the dye was not adequately fixed to the foliage. This can be improved by ensuring that hot water is used and prolonging the immersion time. Again, care must be taken that the foliage isn't damaged.

STEP 6 **Check Color Fastness**

After the foliage has dried, check for color fastness. This can easily be done by dipping the leaf surfaces in water and rubbing it across a paper towel. If color is transferred to the paper towel, the dye is not color fast.



Dip leaf in clean water

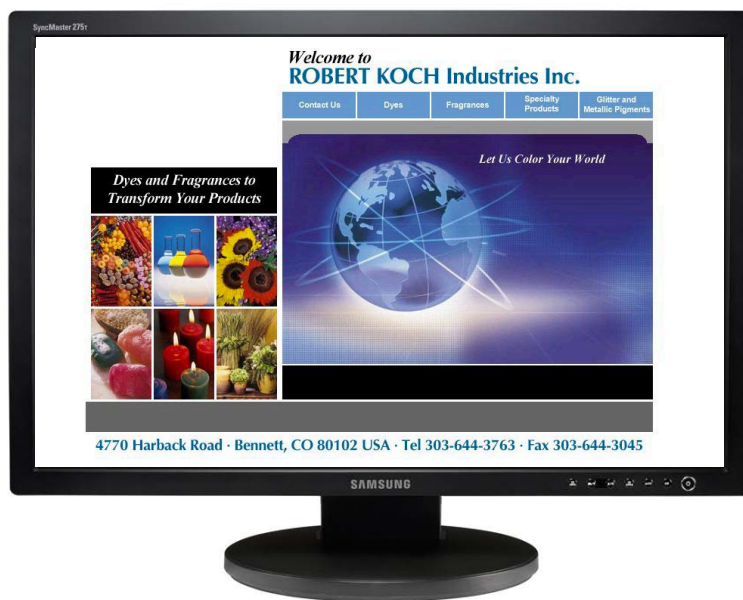


*Rub wet leaf across paper towel
to check for color fastness*

The final color of the dyed foliage will be a mixture of the base color of the natural foliage and the color of the dye applied. Dyeing can only proceed from light to dark. Thus, a light green foliage can be dyed purple but a dark brown foliage cannot be dyed to produce a light pink. In some cases, the high temperature of the dye solution can cause darkening of the foliage.

Due to the nature of this method of coloring, thorough testing must be done before production to ensure product quality and customer satisfaction. This process is one that requires careful consideration of all pertinent factors. There exists a high probability that poorly dyed product will lead to customer dissatisfaction.

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CAUTION: Dyes and chemicals may cause skin and eye irritation if allowed to come into contact with the skin or eyes. The use of gloves and protective goggles is recommended when handling these products.