

# SAMPLE PREPARATION GUIDE

## FOR

## TEXTILES

### Match Textiles

- I Purpose of preparation guide
- II What is needed to start
- III How to begin
- IV What equipment should be used
- V What procedures should be used
- VI What to make
- VII Knowns
- VIII User's Course

## **I. PURPOSE OF THIS GUIDE**

The Datacolor Color Control System requires samples prepared from dyes/pigments on a substrate/substrates. These samples of individual colorant data will comprise a Colorant Data File. This guide will outline basic sample preparation techniques, examples of concentration levels, and tips on how to efficiently begin building a database.

**Datacolor recommends that the user make these Colorant Data File primary samples. There are other sources of these samples, most frequently the colorant supplier. These suppliers may indeed make very good samples, however, they may not always relate back to the user's equipment, methods, substrates or procedures. For accuracy, the user should make these primary samples. There may be times when a secondary source must be used. When this occurs, the user must realize that reproducibility depends greatly on how well the agent's procedures and products correlate with those of the user.**

## **II. WHAT IS NEEDED TO START**

The materials required to prepare primary samples include:

1. Standard lots of your dyes/pigments. These can usually be obtained from your supplier.
2. A sufficient quantity of each substrate on which files will be built. This substrate should be from the same lot. A sufficient quantity should be kept of each substrate in case additional primary samples are to be made.
3. The auxiliary chemicals used for each type of dyeing/printing method. The equipment required to prepare primary samples includes:
  - a. Analytical scales/balances for weighing colorants.
  - b. Laboratory/production dyeing or printing equipment.
  - c. Accurate laboratory vehicles such as pipettes, volumetric flasks, etc.

## **III. HOW TO BEGIN**

1. Choose the first substrate.

This substrate is generally dictated by the plant's major product. Where there are several major products, the substrate that is easiest to dye repeatably should be chosen.

Variation can result when the same colorants are applied to regular and optically brightened substrates. If both are to be used, best results are obtained by preparing primaries on both substrates.

2. Choose the class of dyestuff/pigment

Once the substrate is determined, the class of dyestuff/pigment is set. There may be a substrate that you dye with more than one class of colorant. In this case, it is recommended to build separate files.

#### **IV. WHAT EQUIPMENT SHOULD BE USED**

Generally, lab equipment is available for dyeings or strikeoffs. Primary samples are usually made on lab equipment. If lab equipment correlates with production equipment, the file may be used in production. When correlation is not present, primary samples may be made on production equipment if available, or a Datacolor Applications Specialist can determine how well laboratory and production correlates.

The general rule is to make the primaries on the equipment that will be used to dye/print formulations and corrections.

#### **V. WHAT PROCEDURES SHOULD BE USED**

Primaries should be made with the same procedure that is normally used to dye the substrate. Most companies have established procedures for various substrates and dyeing systems. The primaries should represent normal operating procedures.

**NOTE: Reproducibility and repeatability are essential for accurate results. Areas where problems can arise are:**

1. Not following established dyeing/printing methods/procedures.
2. Weighing of colorants and preparation of solutions.
3. Dyebath pH, surfactants, additives, strike rates, rate of rise, cool down, indiscriminant addition of chemicals.
4. Inconsistent colorant lots.
5. Uniformity of fiber lot to lot; heat and tension history of the fiber prior to dyeing; fiber finishes.
6. Water conditions such as chlorine, fluoride levels, or hardness.
7. Scales/balances with a wide variety of ranges and degrees of accuracy.
8. Technical lab skill preparing samples may vary from person to person.
9. Humidity and temperature variation inside the plant.
10. Substrate preparation, scouring, bleaching, rinsing and wet out.
11. Machine speeds, roll pressure and viscosity in printing/continuous operations.

## VI. WHAT TO MAKE

### 1. Substrate

The substrate to be measured into the Colorant Data File represents a sample that is processed by the dyeing procedure you have selected but with the ABSENCE of dyestuff. This can also be called mock dyeing or blank dyeing.

### 2. Concentration levels.

You should choose between 8 and 12 concentration levels required to characterize the dye build.

**NOTE: Colorants which exhibit non-linear build generally require more concentration levels in the non-linear area, i.e. medium to higher concentrations, therefore 10-12 dyeings may be necessary.**

If you use a dye from 0% to 3.0 % then you should choose 12 concentration levels that best characterize the "build" of that dye. It is important to try to choose increasing concentrations that represent the entire range from 0 to 3%. For example, .01, .025, .05, .10, .25, .50, .75, 1.0, 1.5, 2.0, 2.5, 3.0.

**NOTE: In each case, these levels are only "guidelines" to use for the initial file. Within each class of dyestuffs, for example, there may be colorants that require different primary levels of concentration. For example, there may be two yellows in a file. One yellow may be much stronger than the other. The twelve concentration levels for this yellow would not go as high because this colorant could not be used that high. Therefore, modify the twelve levels to start lower.**

For reactive dyes, you might want to start with a .10% and go as high as 5%.

### 3. Label each sample as to the colorant and concentration.

Usually a tag of some sort stapled to the corner of the sample is best. **DO NOT** label the area to be measured.

**NOTE: Depending on the type of substrate, make sure enough substrate is dyed in case the sample needs to be folded several times for measurement. It is IMPORTANT to dye/print enough substrate so that the sample when folded is instrumentally opaque. Each substrate may require a different number of folds. This is easily determined by reading the dyed sample with different folds. There will be a point when folding another time will not affect the instrument reading. For example, translucent fibers such as nylon may require as many as 8-10 folds (layers).**

Typically, cloth swatches of 10-20 grams, a 5X5 square for printed goods, or a 10-20 gram skein of yarn, which is wound on a white card (for yarn/thread goods).

## VII. KNOWNNS

KNOWNNS refers to samples prepared that have a combination of several colorants, usually one yellow or orange, one red or scarlet and one blue or black. These combinations are chosen from the single colorant primaries previously discussed. Once the primary Colorant Data File is loaded into the computer, these KNOWNNS are needed to start the process of verification of the file by predicting the amount of each colorant. Since we know the actual amount of each colorant, we can determine how well the colorants are behaving when combined.

It is very important to make a sufficient number of these KNOWNNS in order to verify this file. Prepare a series of KNOWNNS from the primary colorants based on the examples on the next page.

The following table of "Known Mixtures" MUST be prepared and brought to the Users Course. It references only 3 of the dyes. At least 6 dyes should be prepared for the Users Course.

MIX #1	YEL .20, RED .50, BLUE .50
MIX #2	YEL .25, RED .60, BLUE .60
MIX #3	YEL .75, RED .50, BLUE .25
MIX #4	YEL .80, RED .40, BLUE .30
MIX #5	YEL .50, RED .15, BLUE .50
MIX #6	YEL .55, RED .20, BLUE .55
MIX #7	YEL 1.0, RED 1.0, BLUE 1.0
MIX #8	YEL 1.5, RED 1.5, BLUE 1.5

## VIII. USER'S COURSE

When you attend the Datacolor User's Course, you must bring the above mentioned known samples on one substrate and at least six colorants (twelve levels of each) that will be used to build a Colorant Data File. Next make up the mock or blank dyeing on the substrate and bring it. Also bring to the course three repeat dyeings of Mix #5. These are used in Quality Control to check reproducibility.

**NOTE: If you are not attending the User's Course, please have all of the above samples prepared when your Applications Specialist arrives at your plant.**

This Sample Preparation Guideline is general in nature and presents examples in exhaust dyeing. If your application is unique, contact the applications department for assistance in preparing the primary samples.