

Finishes: Aesthetic (Appearance) and Performance (Function)

This section describes the basics of fabric finishes. There are many finishes used for many purposes. You may want to explore more on your own—read a basic textile textbook or take a class from a textile art organization near you. Finishes are the last variable of the fabric equation.

$$\text{Fiber} + \text{Yarn} + \text{Structure} + \text{Finish} = \text{Fabric}$$

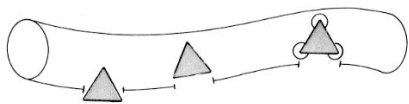
For purposes of this “short course” we will look at two categories: Aesthetic (Appearance) and Performance (Function). Most fabrics go through some type of finish preparation after structuring is completed and before other finishes are applied. Those prep finishes will not be discussed in this course and the full spectrum of finishes will not be covered—just some basics.

Aesthetic/Appearance: Color application

There are several categories of color media application methods including:

- Dyeing
- Pigment application
- Solution or “dope” dyeing

Dyeing is a application of a complex organic chemical dyestuff that combines with the fiber molecule under proper conditions. Typically, the dyestuff is combined in a water bath.



3-7. Once the dye molecule enters the fiber, it is developed preventing its exit.

Pigments do not combine with the fiber molecule. Pigments are applied to the surface with resin binders to hold the pigments in place.

Solution dyeing, sometimes called “dope” dyeing uses a process of putting the color medium into a solution before the solution is extruded through a spinnerette. This method produces the most color-fast (fade-resistant) fabric. It is often used for basic colors, not fashion colors.

Color Matching

Dye Lots. Color application is done in batches (or lots) with each batch possibly producing a slightly different color shade or tone. The human eye is very sensitive to color variations. Knitters know this—if they use one “lot” to knit the body of a sweater and another “lot” to knit a sleeve, the differences may be easily detected even though they’ve used the same type of yarn and color.

Metamerism. Another interesting color matching challenge for dye chemists is that two fabrics dyed to match in light condition may not match in a different light condition—yes, it’s complex. So, light conditions vary: daylight, fluorescent, incandescent, or ultraviolet. So, if you “match” fabrics in a store in one light condition, it may have a different appearance when you take it home.

Aqueous Dyeing

When fabric, yarn or fibers or submerged in a water dye-bath solution the method is called aqueous dyeing. If you’ve dyed Easter eggs—you know that the longer the egg stays in the water solution the color is darker. A higher concentration of the dye stuff results in a darker color.



Dye chemists select a dye class that will be stable and give the best appearance for a fiber type.

Dye can be applied at different times in fabric production. Some examples includes:

- Stock dye—dye is applied to the loose fibers before the fibers are spun into yarns. Used to produce a “heathered” effect.
- Yarn dye—dye is applied to the yarns before the fabric is structured. Technique used before weaving plaid.
- Piece dye—dye is applied to fabric yardage. Dye lot differences often affect each batch. If you are producing multiple garments and must purchase another piece of the “same” fabric—the fabrics may not “match” exactly.
- Garment dye—the garment is made and then the garment is dyed.

Pigment Color Application



Think of pigments as tiny paint chips that are held in a solution applied to the surface of the fabric. The color does not penetrate the fibers; it's adhered to the fabric with a resin. Pigment color application is used for screen, block and roller prints. To assure some stability the fabric must be "cured" to bind it to the surface of the fabric.

Printing Methods

Some fabric printing methods include:

- Roller
- Screen
- Heat transfer
- Digital/photographic

Roller print is the name indicates uses engraved cylinders that apply color continuously.



Screen printing applies color through a screen that has select areas blocked out to keep dye from penetrating.



Screen printing at Key West Fabrics, early 2000's. Photos by K. LaBat

With heat transfer printing, the design is first printed on paper. The paper is laid on the fabric—and heat is applied to transfer the design to the fabric.



Heat transfer photo by K. LaBat

Print types include (but are not limited to):

- Direct print
- Discharge print
- Resist print
- Warp print

Direct print as the name indicates is applied directly to the fabric. The fabric is white or lighter than the design colors which are printed on the fabric.

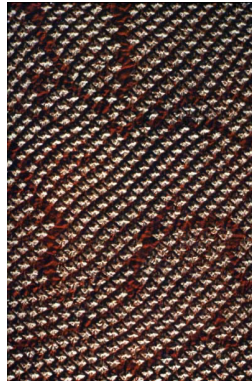
With the discharge print method, the fabric is dyed first, then a discharge chemical is applied in a pattern that “discharges” or destroys the dye in those areas keeping other fabric area colors intact. Some polka-dot fabrics are made with discharge printing.

<https://drkrinfabricprof.com>



Discharge print polka dot. Look at the front and the back of the fabric and note that the “dot” appears on the front and back—although the back “dot” is somewhat blurry. Some polka dot fabrics are made with a direct print—the piece dyed fabric is printed with a pigment—the “dots” are apparent on the front of the fabric and not the back.

Resist prints are made by blocking (resisting) the dye stuff in select areas. Some examples are tie dyes, shibori, and batik. Media used to block color include wax, starch, and resins. After the resist is applied, the fabric is submerged in a dye bath. The blocked areas do not absorb the dye.



For warp prints, the warp is dyed or printed before the fabric is woven. The warp yarns carry the design when the filling yarns are woven in, the result is a blurry image. An example is “ikat”.



Other specialty prints

- Burn-out
- Flock

Burn-out prints. A fabric is woven with two fiber type yarns, typically a synthetic and a cellulosic. After the fabric is woven—a chemical is applied in a design. The chemical (sometimes sulfuric acid) burns away the cellulosic fibers. Not environmentally friendly and difficult to control.



Flock print. The fabric is printed with an adhesive, then fiber particles are “sprinkled” on the fabric. Most “dotted Swiss” fabrics found in fabric stores or ordered online are made with this method. “True dotted Swiss” is a woven technique that is more expensive and difficult to find. Some “faux suede” is made by flocking the entire surface of the fabric. Flock prints can wear quite easily with abrasion. A caution for upholstery applications.



We often take for granted the wonderful array of fabric finishes that add to the beauty of fabrics. Color applications and techniques are complex. Enjoy the results of the work of color application specialists or explore color application methods to make your own fabric designs.

Performance Finishes

If fabric performance cannot be controlled with the first three variables (fiber, yarn, structure), manufacturers may try a finish.

Examples:

- Wrinkle resistance
- Water repellency
- Resistance to stains
- Static charge build-up
- Flame retardance
- Thermal insulation
- And many more

Some fabric labels may tell you about added finishes, but many do not. If you are adding your own designs to a fabric—dyeing or printing, for example, do a test sample first to make sure that a finish on the fabric won't alter your expectations.

Consider again your requirements when you select a fabric for something you want to make?

Think about how the product you're making will be used—by you or another person. If you are making the product for someone, ask them what they want, what are their priorities? The list below may give you some ideas on what to consider:

APPEARANCE/AESTHETICS: Is the fabric attractive and appropriate for its end use? What should it “look” like? Do you have color and surface design preferences? Is appearance the priority?

CARE: How will the fabric be cleaned or cared for? Does the fabric include a recommended care procedure (see more information on care labels)? Will care procedures affect cost? Are you willing to dry-clean the product or do you want easy care, wash-dry-and-wear?

APPEARANCE RETENTION: Will the fabric retain its new look with use and care? Will it resist wrinkling, shrinkage, abrasion, soiling, stretching, pilling, sagging, or other changes you don't want?

DURABILITY: Is the product used often or just occasionally? Will the fabric hold up in use? Will fabric in a product continue to be usable for as long as expected? Should the fabric be strong, resist abrasion, withstand “kid wear,” etc.?

COMFORT: If the product is worn on the body or comes in close contact (like upholstery fabrics), will it feel good? Can the fabric interact with the body, keeping the body warm or cool? Will the fabric insulate, allow heat release, easily absorb perspiration or allow perspiration evaporation?

SAFETY: Are there safety requirements for the product? For example, if you are designing sleepwear for children, be concerned about flammability. Commercially produced children's pajamas must meet *U.S. Consumer Product Safety Commission* regulations. Even if you're not producing pajamas commercially, you may find the CPSC web site helpful:
<https://www.cpsc.gov/FAQ/Childrens-Sleepwear>

ENVIRONMENTAL EFFECTS: Home crafters, home-sewers, and textile artists are becoming concerned about environmental effects of fabrics. Factors may include: how the fabric is produced, used, cared for, and disposed of. Will any of these factors have adverse effects on the environment? Can the fabric be recycled? Is the fabric made of recycled materials?

COST: Are the fabric costs reasonable for how the product will be used? Are care costs reasonable/acceptable? What are you willing to pay?

After you decide your requirements—consider each fabric variable & put it all together

Look at the Fabric Analysis Matrix™—use it as you evaluate fabric choices. As you learn about each variable on this web site, you can make informed decisions. While considering use requirements, analyze the four variables for the fabrics available to you. Change one of the variables and the fabric appearance and performance changes. Map out a matrix in your shopping list or just keep the matrix in mind—you'll get used to using it to make fabric choices.

$$\text{Fiber} + \text{Yarn} + \text{Structure} + \text{Finish} = \text{Fabric}$$

Making a fabric purchase decision on-line can be difficult. Choosing a fabric is easier if you can see and touch it. Read all information on a site carefully. If possible and you have time, order swatch samples.

Make a matrix or copy the one below to help you analyze each fabric. Make notes, use pluses and minuses for each variable and it's use requirement.

Fabric Analysis Matrix™ (The matrix is trademarked by K LaBat. Users of the *drkrin-fabricprof* website are welcome to use it for personal use)

	Fiber	Yarn	Structure	Finish
Appearance/Aesthetics				
Care				
Appearance Retention				
Durability				
Comfort				
Safety				
Environmental Impact				
Cost				

