



KARCEM TEKSTİL · KNOWLEDGE HUB

# Dyeing, Printing and Finishing Process Guide

A fabric's perceived quality is largely determined after the knitting machine: how the colour is fixed, how the print is set and how finishing settles the hand. This guide treats the dye house's colour and finishing engineering as a whole, from a purchasing and quality perspective.

KARCEM Tekstil — Vertically Integrated Dye House

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Two producers can knit the same structure, from the same yarn, at the same GSM; yet one passes approval in the field while the other does not hold on a repeat order. The difference often emerges not at the knitting machine but in the colour and finishing chain that follows. Fixing the colour with the right recipe and repeatably, the print withstanding the wash, the dimensions settling with finish and sanforising; these are all engineering steps that turn fabric into a "working product". This pillar guide opens up the [knitting](#) · [dyeing](#) · [printing](#) line from a dyeing and finishing point of view, shows which method is right in which situation, and points you to the relevant articles when you want to go deeper.

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## Dyeing methods

The dyeing method is chosen according to the fibre type and the desired level of fastness; a wrong match turns into a colour and fastness problem that cannot later be corrected with a finish. Three core methods cover the bulk of knitted fabric production.

### Reactive dyeing

[Reactive dyeing](#) is the standard method for cellulosic fibres (cotton, viscose, modal): the dyestuff forms a covalent bond with the fibre, which is why its wash and perspiration fastness is high. It gives vivid, deep tones; in return it requires a longer process time and careful after-wash, because if unbonded dye is not fully removed from the surface, fastness drops.

### Disperse dyeing

[Disperse dyeing](#) is the method for dyeing synthetic fibres such as polyester; the water-insoluble dyestuff diffuses into the fibre at high temperature and is **fixed** there. In cotton/polyester blends, reactive and disperse dyeing are often planned together, in two-bath or one-bath recipes; at this point the choice of method directly affects cost and lead time. We address the comparison of the two methods and how they combine in blends in the [reactive and disperse dyeing comparison](#) article.

### Pigment dyeing

In pigment dyeing the colour is held on the surface with the help of a binder rather than bonding to the fibre. It offers a wide tonal range and the advantage of low process water; against this, its rubbing fastness and hand are more delicate than reactive dyeing. It is preferred for washed/aged effects and quick tone trials.

The fibre determines the method, not preference. For blended fabrics, write clearly in your sample brief which fibre is dyed with which method and the fastness target; saying "make it red" is not enough — which red is wanted at which fastness must be discussed at the start of production.

## Printing techniques

Printing carries colour not to the entire surface but to a specific pattern; the choice of technique depends on the number of repeats, pattern complexity and order volume. The same pattern gives a different cost, resolution and hand in three different techniques.

Technique	Where it is strong	Practical impact
Digital printing	Photographic and multicolour patterns, short runs	No colour limit, no screen/plate cost; cost per metre does not fall with volume, and speed is limited.
Rotary printing	Repeating patterns, high volume	Very fast and low cost per metre; requires a separate cylinder and setup for each colour, and the number of colours is limited.
Pigment printing	Wide surfaces, opaque and matte effect	Applicable to most fibres; the hand can stiffen, and rubbing fastness depends on the quality of the binder and fixation.

In practice the choice begins with volume: digital printing is flexible for a one-off capsule collection or a sample series; for a seasonal product where you will repeat the same pattern over thousands of metres, rotary printing clearly lowers the cost per metre. The steps of pattern development, colour separation and the strike-off (pre-print trial) are common to every technique; give colour approval not on the full production width but on a representative strike-off.

## Colour management and fastness

Colour is the most debated and most easily misunderstood dimension of the purchasing process. Two separate questions must not be confused: is the colour *correct* (how close it is to the target) and is the colour *permanent* (how well it lasts in use).

- **Colour accuracy ( $\Delta E$ ):** A batch's deviation from the target colour is measured in terms of Delta E; the smaller the  $\Delta E$  value, the closer it gets to being indistinguishable to the eye. At KARCEM this tolerance is run with a  $\Delta E < 1$  target, meaning that on a repeat order the colour is expected to be indistinguishable from the first batch. We explain what colour accuracy means in practice and how it is measured in the [colour fastness and Delta E](#) article.
- **Colour fastness:** [Colour fastness](#) is the permanence of the colour against washing, rubbing (dry/wet), perspiration and light; each is reported with a separate grey-scale grade. End use shifts the threshold: for frequently washed underwear and babywear, the fastness expectation is higher than for outerwear.
- **Measurement and approval:** Colour is measured numerically with a spectrophotometer and confirmed visually in a light cabinet with standardised light sources. Two colours that match under one light but diverge under another (metamerism) are caught at this step.

## Guides in this pillar

Do not give colour approval from a screen alone. Because of monitor calibration, light source and the paper/fabric difference, a tone that looks "correct" on screen produces surprises on the fabric. Confirm with a physical sample and a spectrophotometric measurement together.

## Finishing and finish

Fabric coming out of dyeing is not yet finished. **Finishing** (textile finishing) is the set of steps that gives the fabric its final hand, dimensional stability and function; perceived quality is often determined exactly here. A typical flow consists of a few core steps:

- **Pre-treatment:** The **greige** surface is made ready for dyeing through wetting-out, bleaching and washing; the quality of this step directly affects the evenness of the colour that follows.
- **Stenter and sanforising:** Width and GSM are set on the stenter, and shrinkage is brought under control with sanforising. Dimensional tolerance is typically framed as  $\pm 5\%$  in GSM and a few centimetres in width.
- **Functional finish:** **Finishes** such as hand (softness), water repellency, antibacterial or soil-release are added according to the end use.
- **Raising:** In structures such as two- and three-thread fleece, the inner face is napped through **raising**; the soft, warm hand of sweatshirts and hoodies is gained at this step.

Each step builds on the previous one; an unevenness in pre-treatment comes back as a stain in dyeing, and an error in the finish as a difference in the hand. That is why the finishing chain must be planned not step by step but as a whole, and recorded with the values measured in each batch.

## The engineering advantage of an integrated facility

Running dyeing, printing and finishing in a single facility is not just a logistical convenience but an engineering decision with a direct effect on quality. When intermediate transport and waiting are removed, the **greige** fabric enters dyeing and printing in a consistent state; the colour recipe, print parameters and finishing settings are kept in sync under the same roof, over the same data. When a problem arises, the cause is sought not in a single supply link but along a traceable line.

The practical result comes together under three headings: shorter lead times (no waiting and transport between steps), more consistent colour and batch matching (dyeing and inspection are done with the same calibration) and a single point of contact end to end. We have deepened why this advantage is about quality control and not only speed in the [advantage of an integrated facility](#) article.

## Go deeper

The pillar guide shows the whole; we have deepened the points that most often trip people up during a decision in separate articles:

- [Reactive and disperse dyeing](#) — which fibre with which method, and how they combine in blends.
- [Colour fastness and Delta E](#) — how a colour's accuracy and permanence are measured.
- [The advantage of an integrated facility](#) — the effect of vertical integration on quality.

For the entire production line you can look at the [knitting · dyeing · printing](#) page, for fabric families at the [fabric catalogue](#), and for the documents that secure fastness tests at our [certificates](#). For technical terms encountered for the first time, you can refer to the [Glossary](#).

## With KARCEM

KARCEM is a vertically integrated operation combining knitting, dyeing, printing and finishing under one roof; this means the colour is controlled by a single hand from greige fabric to finished hand. We make your colour target concrete in a sample → approval → production flow, and confirm batch consistency with a  $\Delta E < 1$  target and wash, rubbing and perspiration fastness tests; we also secure traceability with GOTS, OCS, GRS, RCS, BCI and UPMADE® certified processes. To set up your colour and finishing specification correctly, [send us your sample and quotation request](#); let our team guide you from the start with the right recipe.