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# DEMANDS MADE ON MODERN GARMENT DYEING

In recent years garment dyeing has conquered a firm position in the textile industry and garment finishing. CHT makes an important contribution to this segment with its special dye range BEZAKTIV FX and creative finishing processes.



The advantages of garment dyeing enable the market, thus the brands and retailers, to quickly launch new articles beyond classic seasonal collections. Dye shades, styles, looks as well as trends can be combined and quickly implemented just like the customer desires and demands this. The batch size can also be highly varied, which is an enormous advantage to classic manufacture from a dyed fabric. The typical life style characteristics of garment dyeing such as the soft handle, the usually very good shrinkage values or if desired the slight wash look are fixed features of many current casual and sportswear product lines. Requirements on wet and light fastness levels as well as on sustainability must equally be fulfilled by the corresponding product selection and process.

## Advantages of garment dyeing for the market:

- Quick reaction to the demands made by the fashion industry, e.g. certain shades or look
- Short pre-run time and very flexible batch sizes
- Fastness levels according to the demand respectively application field or country
- Typical garment dye characteristics such as handle/feel, wash look and shrinkage
- Fashion effects and finishes depending on the requirements (e.g. Old-Look, Cold-Dye, local bleach / discharge, destroyed or coating effects)

## Garment dyeing does of course bear some disadvantages which should not go unmentioned:

- Blends made of cellulose and polyester can only be dyed to a limited extent, e.g. by using a carrier or an HT drum.
- Since the batch size is limited, batch-to-batch deviations of >0.7 dE may result depending on the shade, material, operative conditions as well as the dye selection.
- The affinity and pretreatment quality of many low cost RFD (ready for dyeing) materials varies, which can only be compensated by an additional pretreatment as well as by



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the selection of an optimum dyeing process.

- Compared to continuous dyeings, the finishing costs tend to be higher.
- Suboptimal processes and very long processes (e.g. due to subsequent feeding or corrections) bear the risk of pilling and damaged selvages.
- A good printing in register (uniform sizes) is hard to achieve with certain articles, especially knits.
- Minor quality elastane may strongly suffer from the long processes, the high temperature or the strongly alkaline pH value.

## Most garment dyeings are realised in the classic way, thus without strong effects. The following two categories can be distinguished

Slight wash look on selvages and seams:

- All of the BEZAKTIV FX dyeing processes can be used but the COMBI-DOS process offers a very high process safety.
- A high sustainability is ensured thanks to very fast dyes with excellent fastness levels to multiple washing.
- The higher the soaping temperature is selected, the stronger the resulting wash look will be.

- Depending on the customer's requirements made on the permanence of the dyeing, direct dyes are partially applied. Repeated household laundries strongly increase the wash look, which is not always desired.
- The bio-polish treatment (removal of pilling) is carried out directly after the dyeing.

Clean look without wash optics:

- Bio-polish prior to dyeing.
- A really gentle and very sustainable
- BEZAKTIV FX dyeing process is the COMBI-DOS process combined with low temperature soaping at 50 °C.
- Machine downtimes between rotation direction changes also help protect the fabric.
- Under certain conditions we recommend turning the fabric inside out.

**Apart from the above mentioned classic looks garment finishing also offers a wide range of other possibilities to meet fashion requirements:**

- Old-Dye: A look just like worn off or aged material which can be achieved with reactive, direct or acid/metal complex dyes.
- Random Wash, Blanket Wash, Acid Wash, Moonwash or Marmorizzato-Wash, etc. where the dyed pieces are treated with a bleaching agent which is indirectly applied onto the surface, e.g. by means of a cloth, pumice stones or polystyrene balls.
- Cold-Dye pigment dyeing in the dip tumble process which shows a high-low contrast caused by migration during drying.
- Local treatments such as
- spray bleach (e.g. brightened thigh part, etc. by means of a bleaching solution)
- whiskers (light-dark creases resulting from the sitting posture, e.g. with laser or manual sand blasting)
- destroy (desired mechanical destructions on certain parts and seams)
- three-dimensional creases (imitation of creases in the crotch area and the hollows of the knee)

Looking at this great number of different finishes it is of course interesting to see whether there are suitable dye ranges to realise them. The BEZAKTIV FX range is a versatile tool box offering the suitable tool for any requirement. With the classification into 14 dye selections it is easy to select the optimal combination for each requirement from the 34 BEZAKTIV FX types in total. Let's have a closer look on the four main application fields:

## 1. Classic pieces with a wash fast clean look and highest sustainability

- BEZAKTIV FX low temperature soaping selection: Extremely sustainable range suited for soaping at 50 °C with a total of only 4 treatment baths. Thanks to the short process and low soaping temperature this selection hardly causes any used or wash look.
- The COMBI-DOS process, an optimised isothermal dyeing process at 60 °C with a combined dosage of the salt / alkali mix, allows for an optimal control of the parameters and the levelness with a simultaneously optimised dyeing time.
- The less mechanical strain, thus friction, the fabric is exposed to during the dyeing and drying process, the less washed off the resulting fabric will look. The optimal control of the drum rotation is really helpful to achieve this. The turning speed of the dyeing drum as well as the machine downtimes between the rotation direction changes are equally affected. Depending on the colour depth and machine type a downtime of 30-90 seconds between the rotation direction changes can be installed in the fixation phase of the dyeing as well as during the rinsing and soaping process. This measure is extremely effective and simple, in particular in case of medium to dark shades where the undesired used look is really challenging. The effective time where the load is rotating, thus mechanically strained, can be reduced by up to 80%. What's most important, there aren't any disadvantages or risks through an increased or reduced rotation speed.
- If sustainability is a decisive factor but a typical garment dye look shall nevertheless be achieved, we recommend respecting downtimes of a few seconds as well as carrying out the bio-polish after the dyeing.

## 2. Pieces with the classic garment dye look, thus a slight high-low on selvages and seams

- BEZAKTIV FX standard selection: Very good cost-effectiveness, optimally adjusted dyeing elements with a very good resilience, reproducibility as well as a good general fastness level.
- Both the COMBI-DOS and the temperature step process are suited.
- The COMBI-DOS process facilitates not only an optimal control of the penetration and levelness but also an optimal combination of all of the BEZAKTIV FX elements. In addition, it levels out differences between the various exhaust and fixation characteristics in the best possible way.

- The enzymatic bio-polish treatment is usually carried out after the dyeing.
- The selection of the best dye combination is facilitated by the recipes given for the trend colours of the Fashion News published twice a year by the CHT Group (see e.g. Fashion News Spring/Summer 2019: BEZAKTIV FX – Reactive dyes exhaust on CO).

### 3. Old-Dye process for pieces with a strong wash out look on the surfaces and along the seams

- In the Old-Dyeing process the dye is first fixed onto the material surface and subsequently washed off by means of an abrasive washing in a way that a salt 'n' pepper look results.
- A pre-cationisation is used for the fixation of garment dyes on the surface. A cationically charged polymer (e.g. DENIMCOL FIX-OS) is reactively fixed on the hydroxy group of the cellulose strongly increasing thus the exhaustion capacity of the cellulose.
- With the specifically adjusted subsequent BEZAKTIV FX Old-Dye process it is possible to let the dye exhaust to the fabric surface without penetration. In case of light to medium shades it is often possible to work without or only with 50 % of the usual salt quantity.
- Due to the indirect fixation of the dye via the cationic bridge the light fastness of the dyeings is usually reduced by 1-2 grades. We therefore recommend applying dyes with highest light fastness levels (e.g. BEZAKTIV FX light fast selection). For the best possible surface dyeing not only the light fastness of the elements is important but also a quick substantive exhaustion.
- An optimal help for selecting the best dye combination for the corresponding shade is offered by CHT with the recipe recommendations in den Fashion News brochures

«Old» dyed trouser.



Dischargeability.

(see e.g. Fashion News Spring/Summer 2019: BEZAKTIV FX – High Light Fastness).

- For achieving the desired wash out or old look a stone-wash process with a neutral bio-polish enzyme is carried out. Depending on the desired look and handle as well as the existing mechanical conditions in the washing drum this may be controlled with or without adding pumice stones.

### 4. Dischargeable dye shares for subsequent bleaching processes by means of spray gun or

- Random-Wash or Acid-Wash, etc.
- By applying a bleaching solution it ought to be possible to bleach the dyeings either possibly white or at least in a pale tone-in-tone shade. This facilitates the manufacture of very fashionable pieces with authentic signs of wear.
- In addition to the BEZAKTIV FX colour chart, a brochure with colour illustrations of the dischargeability of all of the BEZAKTIV FX dyes, each in 2 colour depths towards various bleaching solutions and application technologies is offered. With these data the best bleachable dye elements as well as the matching bleaching solution can be determined.
- A further help for selecting the best dye combination for the corresponding shade is offered by CHT with the recipe recommendations in den Fashion News brochures (see e.g. Fashion News Spring/Summer 2019: BEZAKTIV FX – Best achievable dischargeability).
- For the selection of the bleaching agents focus is set on our sustainable organIQ BLEACH system. It is free from metals, readily biodegradable as well as suited for GOTS and bluesign® approved.

A clear trend in garment dyeing is sustainability. It is also obvious that very fast dyes are mostly demanded. Direct, pigment and acid and metal complex dyes are increasingly substituted by selected reactive dyes. Reactive dyes offer vast advantages both for their application as well as for the use of the completed garment.

The tool box of the BEZAKTIV FX dyes is suited as one-for-all solution, namely ONE dye range to meet ALL garment dye requirements:

- Standard ternary elements with excellent dyeing behaviour, fixation degree and cost effectiveness
- State-of-the-art range in terms of sustainability and ecological behaviour through low temperature soaping
- Excellent dischargeability towards organIQ BLEACH T or common bleaching agents
- Three non-photochromic yellow elements which provide for constant colours even with critical khaki, grey and beige shades. This facilitates the communication between the finishing company and the customer.
- Selection with metal-free elements
- Selection with elements which do not stain polyamide
- Selection with very light-fast elements
- Selection with elements with a good perspiration light fastness (e.g. for tennis clothes, uniforms, etc.)
- Selection with elements for demands according to DIN EN ISO 105-C09 (multiple washing with a bleaching activator)



BEZAKTIV FX: state of the art in sustainability and ecology.

- Colour intensive respectively very economical range
- Selection with a high fastness to chlorinated bath water
- Selection for turquoise and green at a dyeing temperature of 80 °C
- Very vast PCA-free range (without parachloroaniline) including black and navy
- All of these elements are suited for continuous dyeing.

More detailed information on the CHT garment dyes (e.g. the BEZAKTIV FX colour chart and current editions of the Fashion News) are available here: [www.cht.com/garment-dyes](http://www.cht.com/garment-dyes). ■

BEZAKTIV FX: The optimal dyestuff combination for every shade and purpose.

