



DR. PETRY
TEXTILE AUXILIARIES

OLIGOMER MINIMISATION

Finishing of polyester yarn
in consideration of
oligomer minimisation



PREFIXATION/ PRESHRINKAGE

The release of oligomers during the dyeing process can be reduced by a prefixation/preshrinkage of the yarn with hot steam.

PREWASH

Prior to the dyeing process the spin preparations should be removed by prewashing.

1.0 – 2.0 g/l PERLAVIN PAM

30 min at 80 °C
rinse

DYEING

Factors having an influence on the release of oligomers:

Process parameters

- a high liquor ratio has an advantageous effect
- too fast heating up rates lead to an intensified release of oligomers
- too long a dyeing time at final temperature (HT-temperature) should be avoided
- draining at HT-temperature has a positive effect
- a high winding density leads to an increased filtration of the oligomers

Dyestuff

The kind and concentration of the disperse dyes has a decisive influence on the release of oligomers:

- the deeper the dyeing, i. e. the higher the quantity of dyestuff used, the more oligomers are displaced from the inside of the fibre
- the dyestuff molecule (low, medium or high macromolecular/anthraquinone or azo dyestuff) also has a decisive influence. A change of the dyestuff type may possibly reduce the oligomer problems distinctly

Auxiliaries

- strongly fibre swelling dyeing accelerators increase the release of oligomers
- oligomer dispersing agents in the dyebath reduce the deposit/filtration of oligomers
- by adding of salt the release of oligomers can be repressed

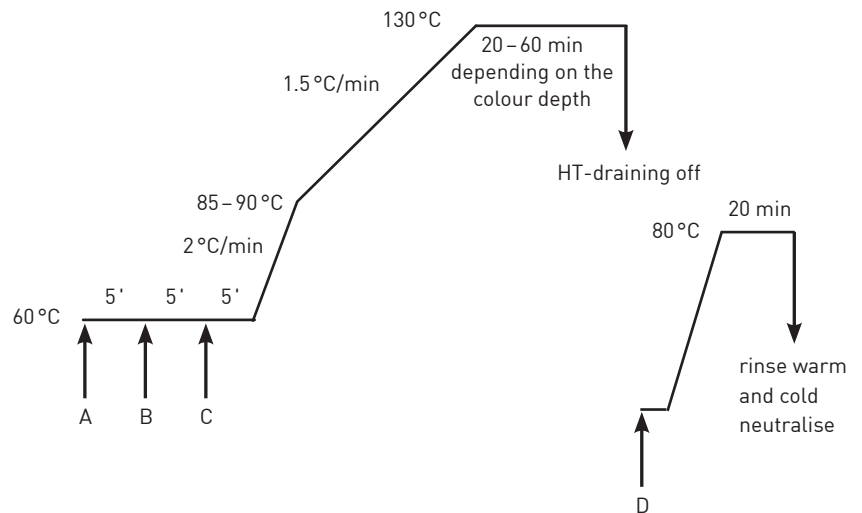
Reductive clearing

- application of cationic auxiliaries, which accelerate the saponification of oligomers at the reductive clearing have an advantageous effect. In order to disperse the oligomers and to reduce a filtration the auxiliary should contain besides the cationic components also dispersing additives

DYEING PROCESS IN THE SLIGHTLY ACID MEDIUM

Dyeing

Reductive clearing



A: 0.5 – 1.0 g/l PERIWET ELR (rapid wetting agent and deaerator)

B: 1.0 – 2.0 g/l PERIGEN CD (levelling and penetrating agent)
 1.0 – 2.0 g/l PERIGEN ASW (dispersing agent)
 0.5 – 1.0 g/l PERISOL RIO (oligomer dispersing agent)
 5.0 – 10.0 g/l Glauber's salt

pH 4.5 – 5.0 with acetic acid

C: x % disperse dye

D: 2.0 g/l sodium hydrosulfite
 3.0 – 4.0 ml/l caustic soda solution 50 %
 2.0 – 3.0 g/l PERISOL NU (dispersing agent and saponifying accelerator for oligomers)

or

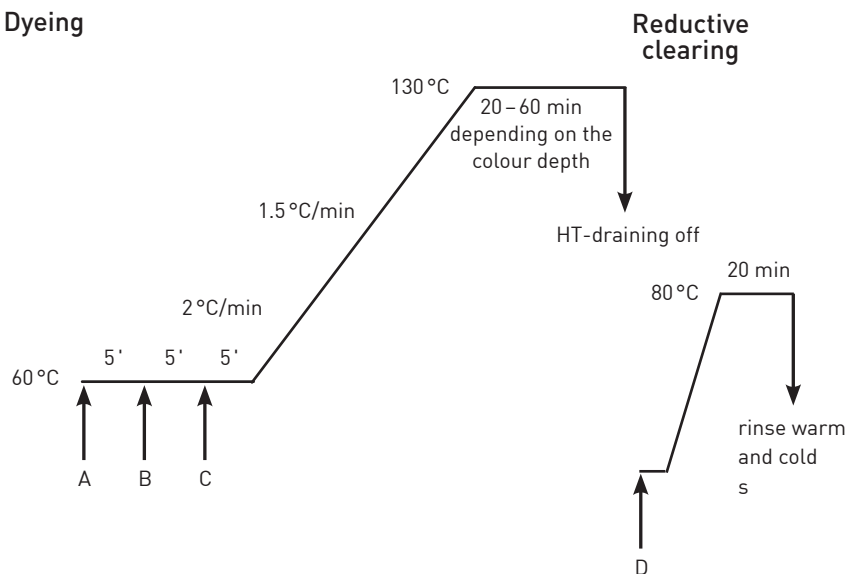
2.0 – 4.0 g/l PERISTAL RCV
 3.0 – 4.0 ml/l caustic soda solution 50 %
 2.0 – 3.0 g/l PERISOL NU (dispersing agent and saponifying accelerator for oligomers)

Besides the conventional dyeing in the slightly acid pH range the dyeing in alkaline medium offers a further possibility to reduce oligomers.

Under HT-conditions in the alkaline medium the oligomers are saponified, thus oligomer deposits on the fabric and in the dyeing apparatus can be distinctly reduced.

DYEING PROCESS FOR THE ALKALINE DYEING

Dyeing



Reductive clearing

- A:** 0.5 – 1.0 g/l PERIWET ELR (rapid wetting agent and deaerator)
- B:** 1.0 – 2.0 g/l PERIGEN CD (levelling and penetrating agent)
1.5 g/l PERIBUFFER PDA (buffer system)
1.0 g/l PERIGEN DLA (dispersing agent)
pH 9.5 (is automatically set by PERIBUFFER PDA)
- 0.5 – 1.0 g/l PERISOL RIO (oligomer dispersing agent)
- C:** x % disperse dyes
- D:** 2.0 g/l sodium hydrosulfite
3.0 – 4.0 ml/l caustic soda 50 %
2.0 – 3.0 g/l PERISOL NU
or
2.0 – 4.0 g/l PERISTAL RDV
3.0 – 4.0 ml/l caustic soda 50 %
2.0 – 3.0 g/l PERISOL NU



FINISHING

For the finishing a lubricant should be applied which effectively avoids the abrasion of oligomers.

2.0 % PERIFIL JAK/R

pH 6

initial temperature: cold

raise temperature in 30 min to 75 °C

treat 10 min at 75 °C

or

2.0 % PERIFIL LCV/R

pH 6

initial temperature: cold

raise temperature in 30 min to 65 °C

treat 10 min at 65 °C

CLEANING OF THE DYEING APPARATUS

To remove oligomers and dyestuff residues, the dyeing apparatus should regularly be boiled out with alkali and hydrosulfite under addition of an auxiliary which accelerates the saponification of oligomers.

3.0 – 5.0 g/l PERISOL NU

2.0 – 4.0 ml/l caustic soda solution 50%

3.0 – 5.0 g/l sodium hydrosulfite

30 min at 98 °C

rinse thoroughly in the overflow

OVERVIEW ON THE RECOMMENDED AUXILIARIES

Denomination	Brief description
PERIBUFFER PDA	<p>Organic buffer for alkaline dyeing of polyester Composition: organic buffer Ionic character: nonionic</p> <p>With PERIBUFFER PDA an initial pH-value of approx. 9.5 is set. During dyeing the pH value is reduced to approx. 8.5. PERIBUFFER is used in combination with PERIGEN DLA.</p>
PERIFIL JAK/R	<p>Yarn lubricant Composition: special hydrocarbons and emulsifiers Ionic character: slightly cationic</p> <p>Yarn lubricant based on a well-balanced combination of high molecular waxes and oily substances. Offers very good gliding properties to polyester yarns. An abrasion of surface oligomers is avoided effectively.</p>
PERIFIL LCV/R	<p>Yarn lubricant Composition: paraffins, silicones and additives Ionic character: cationic</p> <p>The combination of waxes and silicone oil in PERIFIL LCV/R provides the finished yarn a good smoothness, thus avoiding an abrasion of oligomers during processing.</p>
PERIGEN ASW	<p>Dispersing agent Composition: Naphtalene sulphonic acid condensate Ionic character: anionic</p> <p>Dispersing agent for polyester dyeings to avoid dyestuff agglomerations.</p>
PERIGEN CD	<p>Levelling and penetrating agent Composition: aromatic esters and fatty alcohol polyglycol ether Ionic character: nonionic</p> <p>PERIGEN CD causes an equal absorption of disperse dyes of different constitution during heating-up phase. As well in the slightly acid as also with alkaline polyester dyeings PERIGEN CD offers a good levelling and absorption of the fibre under atmospheric and also under HT-conditions.</p>



Denomination	Brief description
PERIGEN DLA	<p>Dispersing agent Composition: sulphonated, aromatic condensation products Ionic character: anionic</p> <p>PERIGEN DLA is a dispersing agent which increases the dispersion stability of disperse dyes. The agglomeration of dyes is avoided. For the alkaline dyeing of polyester PERIGEN DLA is combined with PERIBUFFER PDA.</p>
PERISOL NU	<p>Dispersing agent and saponifying accelerator for oligomers Composition: fatty alcohol ethoxylates and quaternary ammonium compounds Ionic character: cationic</p> <p>PERISOL NU is used in combination with caustic soda and hydrosulfite resp. PERISTAL RCV for the reduction of oligomer deposits in the reductive clearing of disperse dyeings. PERISOL NU distinctly accelerates the saponification of oligomers with caustic soda. The dispersing properties intensify the removal of oligomers.</p>
PERISOL RIO	<p>Oligomer dispersing agent Composition: carboxylic acid polyglycol ester Ionic character: nonionic</p> <p>PERISOL RIO possesses oligomer dispersing properties and thus reduces a filter effect of oligomers in wound packages.</p>
PERISTAL RCV	<p>Liquid reduction agent for the reductive clearing Composition: polyhydroxy compound and nonionic tensides Ionic character: nonionic</p> <p>PERISTAL RCV is a liquid reduction agent, free from sulphur, for the reductive clearing of polyester. PERISTAL RCV stands out for a high biodegradability and simple handling.</p>
PERIWET ELR	<p>Low foaming rapid wetting agent and deaerator Composition: Fatty alcohol polyglycol ether and phosphoric acid ester Ionic character: nonionic</p> <p>PERIWET ELR disposes of a high wetting capacity, very good deaerating properties and foam dampening effect.</p>



Denomination	Brief description
PERLAVIN PAM	<p>Washing agent Composition: fatty alcohol polyglycol ether Ionic character: nonionic</p> <p>PERLAVIN PAM has a high wetting capacity and a particularly high emulsifying capacity for preparations.</p>



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