Uniperol® Level PEL Conc.

A non-foaming dispersing and leveling agent for the dyeing of polyester fibers with Disperse Dyes under high temperature conditions. Uniperol® Level PEL Conc. controls dye exhaustion to improve on-tone shade buildup during dyeing. This product also aids in trimer control to dramatically reduce oligomer redeposition on fabric and equipment.
Chemical nature
Special mixture non-ionic and anionic components.

Physical form
Amber colored, low viscous liquid.

Shelf life
Uniperol® Level PEL Conc. can be kept in the original sealed containers at temperatures between 5 °C (41 °F) and 35 °C (95 °F) for at least 12 months. Partly used containers should be kept tightly closed and used up as soon as possible.

Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
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<tbody>
<tr>
<td>pH (0.5% solution)</td>
<td>Approx. 7</td>
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<tr>
<td>Density (20º C)</td>
<td>Approx. 1.07 g/cm³</td>
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<tr>
<td>Solubility</td>
<td>Readily soluble in cold water.</td>
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Action

Dyeing auxiliary for dyeing polyester fibers with Disperse Dyes.
Assists in:
- Dye leveling;
- Shade synchronization;
- Trimer control;
- Dye dispersion;
- Emulsification of residual oils.

Application

Make-up
The product disperses well in warm or cold water with slight agitation. It is customarily added to the dye bath via the chemical addition.
If required, it can be added to the dye make-up tank prior to addition of dye.

Improves dye bath conditions
Uniperol® Level PEL Conc. improves the dispersion stability and migration properties of Disperse Dyes when dyeing atmospherically or under high temperature conditions.

Reduces dye spots
Under high temperature dyeing conditions and when the dye bath is subjected to severe agitation, dye agglomeration and possible precipitation may occur, which manifests itself as dye specks. Uniperol® Level PEL Conc. helps prevent individual dye particles from agglomerating during dyeing. Special components in this product increase the solubility of the Disperse Dyes in water and produce dissemination of any agglomerations that may occur. This results in increased migration and fiber penetration of the Disperse Dyes.
Typical formula

The following general formulation for dyeing is suggested:

X%          Disperse Dye

0,5 – 1,0 g/L * **Uniperol**® **Level PEL Conc.**

X g/L    Lufibrol® Chelant TA (optional)

acetic acid (pH 4,5 – 5,0)

* Recommendation:

0,5 g/L  **Uniperol**® **Level PEL Conc.** for dark shades

1,0 g/L  **Uniperol**® **Level PEL Conc.** for light shades

For 50/50 blends fabrics, use half the amounts mentioned above, depending on the deep color.

**Uniperol**® **Level PEL Conc.** controls dye exhaustion with only a slight retarding effect. This effect has no negative influence on the final shade if the product is used in recommended amounts. Higher concentrations can retard somewhat; this feature is useful in shade repair or in shade stripping.

**Reductive afterclear**

**Uniperol**® **Level PEL Conc.** is very effective in after clearing baths for polyester. Reductive post-clearing **Uniperol**® **Level PEL Conc.** supports the fastness-improving effect of the reducing agent by dispersing unfixed dye particles and their decomposition products and preventing them...
from separating out of the liquor and re-depositing on the fibers. In both post-clearing methods, Uniperol® Level PEL Conc. also reduces precipitation of detached PES oligomers, which have a strong tendency to crystallize out as the liquor is cooled below 100 °C. It is completely stable to normal after clearing concentrations of caustic soda and solution hydrosulfite. A recommended clearing formula would be:

Guideline recipe for alkaline reductive clearing

2 – 3% Sodium hydrosulfite
2 – 3% Caustic Soda 50%
1% Uniperol® Level PEL Conc.

71 °C, 10 – 20 minutes
Rinse well and neutralize with acetic acid.

**Acid Reductive afterclear**

Guideline recipe for acid reductive clearing

2 – 3 g/L conc. acetic acid (add separately to the dye bath before the reducing agent)
2 – 3 g/L Cyclanon® Clear ECO
2 – 3% Uniperol® Level PEL Conc.

After treat for 10 – 20 min. at 70 – 80°C

**Special Properties**

Uniperol® Level PEL Conc. does not foam. It can be used in high turbulence machines without concern.

**Additional scouring during dyeing**

The unique emulsifiers in Uniperol® Level PEL Conc. help remove and keep small amounts of residual spinning oils from re-depositing onto the fiber. This can reduce smoking during drying.

The product can also impart a certain lubricity to the fiber during the dye cycle.

**Trimer control**

Additionally, the superior dispersing properties of the Uniperol® Level PEL Conc. helps dramatically reduce oligomer and trimer re-deposition on fiber and machinery. The outstanding dispersing effect of Uniperol® Level PEL Conc. considerably reduces re-deposition of oligomers on polyester fibers and dyeing machine walls. It is especially effective on package and Jet equipment.

**Additional effects**

As a by-product of synthesis, PES fibers contain low-molecular-weight compounds that migrate to the surface under heat treatment (e.g. dyeing at 130 °C) and can pass into the liquor. This migration becomes more pronounced with increasing time and temperature. These
oligomers are initially dissolved as individual molecules or finely dispersed, but they quickly agglomerate to form compact, sharp-edged crystals on the fibers results in graying of the dyeings, reduces the liquor circulation in the dyeing of wound packages, and adversely affects further processing, especially of yarns, by causing thread breaks and dust.

Because of its outstanding dispersion effect, Uniperol® Level PEL Conc. dramatically reduces deposition of oligomer crystals on the PES fibers, thus averting associated problems.

These substances are mainly cyclic oligomers (trimer) of ethylene tetra phthalate, which are only sparingly soluble in water.

Oligomers are, at first, finely dispersed in the dyeing liquor at 125 – 130 °C. but they are liable to agglomerate and deposit on the textile material and on the dyeing equipment as the bath cools.

These deposits are in themselves colorless, but they may be colored by adsorbed dye. They are particularly liable to cause trouble with smooth or texturized continuous filament fibers. In the dyeing wound packages, oligomer precipitation may hinder the liquor circulation. It may also impair the surface smoothness of the fibers, thus causing trouble processing, and also impairing the crock fastness of the finished dyeing.

The superior dispersing properties of the Uniperol® Level PEL Conc. help dramatically reduce oligomer and trimer re-deposition on fiber and machinery.
Oligomer deposits on polyester yarn

Tradicional dyeing process of PES; pH 4.5

Dyeing process of PES with 1.5% Uniperol® Level PEL Conc.; pH 4.5
Safety

When using this product, the information and advice given in our Safety Data Sheet should be observed. Due attention should also be given to the precautions necessary for handling chemicals.

Note

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights, etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed. Responsibility for compliance with the requirements of the downstream textile market rests with the textile processor.

The term ‘free of APEO’ is defined as, see: www.basf.com/textileresponsibility