**Key Benefits**

- **Hydrophobic**
  - excellent water resistance
  - excellent scrub resistance
  - reduces water spotting

- **Stabilizes the viscosity of tinted paints**

- **Prevents dry-out in pigment concentrates**

**NUOSPHERESE® 3200**

Unique hydrophobic humectant for use in waterborne VOC compliant colorants and pigment dispersions

*Innovation ● Compliance ● High Performance*
Introduction

NUOSPERSE® 3200 is a unique liquid designed for use as a humectant in aqueous colorants and pigment dispersions.

NUOSPERSE® 3200 offers an environmental friendly alternative to traditional organic co-solvent humectants such as ethylene glycol or (poly) propylene glycol. In order to be able to formulate zero-VOC colorants these organic solvents have to be replaced.

NUOSPERSE® 3200 prevents rapid drying of pigment concentrates in production and tinting machines. It also stabilizes the viscosity of tinted paints and has minimal influence on the water resistance properties of paints.

NUOSPERSE® 3200 is primarily based on a hydrophobic polymer emulsified in water. The highly compatible chemistry of NUOSPERSE® 3200 allows its use in water containing colorants and pigment dispersions for almost all waterborne coating systems.

Key Benefits

- Hydrophobic humectant
- Reduces or eliminates VOC in colorants
- Good pigment suspension properties
- Liquid product for easy incorporation
- Prevents nozzle clogging
- Much less influence on paint properties than conventional humectants giving:
  - better blocking
  - better scrub resistance
  - better early water resistance

Chemical and Physical Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Milky white liquid</td>
</tr>
<tr>
<td>Active matter</td>
<td>approx. 65 %</td>
</tr>
<tr>
<td>Solvent</td>
<td>water</td>
</tr>
<tr>
<td>pH</td>
<td>7 - 9</td>
</tr>
<tr>
<td>Density</td>
<td>approx. 1.03 g/cm³</td>
</tr>
</tbody>
</table>

Incorporation and Levels of Use

NUOSPERSE® 3200 is used at concentrations of 5 – 15%, based on the total weight of the colorant.

With hydrophilic pigments, NUOSPERSE® 3200 is typically added before the grinding stage. With hydrophobic pigments NUOSPERSE® 3200 is typically added after the grinding process.
Colorants using the humectant NUOSPERSE® 3200 have limited influence on the viscosity of the base system. The viscosity of a paint typically drops significantly on addition of universal colorants with humectants based on organic co-solvents such as ethylene glycol or (poly) propylene glycol. Colorants using NUOSPERSE® 3200 technology do not cause this problem. This is true for waterborne coatings based on a large variety of binder chemistries.

Graph 1 shows the excellent viscosity stability achieved in an acrylic emulsion thickened with an associative thickener.

The addition of 10% NUOSPERSE® 3200 results in a slight increase of KU viscosity where propylene glycol, PEG 400/90 and water (as reference) show a strong drop in viscosity.

NUOSPERSE® 3200 is an aqueous emulsion of a water-insoluble polymer. This hydrophobic polymer has much less influence on early water resistance than conventional water-soluble humectants like PEG or other glycols.

The picture below shows the spread-out of water droplets on paint films dried for 24 hours. The colorant was added at 10% on volume to the base paint. The droplet on the paint with NUOSPERSE® 3200 keeps a “ball form” with a high contact angle. However the droplet on the paint with the PEG 400 colorant has spread out and wet the surface.
In the graph below, the weight loss in the scrub resistance test after 400 cycles are shown. The colorant addition to base paint was 8% on volume. Four different colorants were tested. In all cases NUOSPERSE® 3200 shows much lower weight loss on scrubbing compared to either PEG or propylene glycol.

![Graph showing scrub resistance](image)

The hydrophobic humectant NUOSPERSE® 3200 shows less blocking compared to hydrophilic humectants like PEG 400. The test systems are a waterborne acrylic and waterborne alkyl wood coatings. Colorant addition was 10% on volume.

![Graph showing blocking](image)

**Conclusion**

The NUOSPERSE hydrophobic humectant greatly improves both the performance and environmental aspects of waterborne colorants. Its unique chemistry gives good viscosity stability, excellent water, scrub and block resistance, and no VOC. It will present colorant having a negative impact on dry-out without the coatings performance properties.