

The trend toward concentrated optical brighteners

New OBAs can lower transport costs & related CO₂ emissions by up to 35%

By Dr. Andrew Jackson, Global Product Manager - Optical Brightening Agents, Paper Solutions Business, Archroma

Archroma, a global leader in color and specialty chemicals, sees strong demand for its recently launched concentrated optical brightening agents (OBAs). Customers benefit from the resulting reduction of transportation costs by up to 35 percent, while the environment benefits from lower CO₂ emissions by a similar amount.

In June 2013, Archroma launched Leucophor® ACK, at that time the most concentrated, urea-free, disulpho liquid available to paper makers in Europe. The patented, new-generation optical brightener is primarily intended for stock application in sized and unsized papers. This unique product quickly gained strong acceptance in the market. Since then it has been selected by more than 30 leading producers of printing and writing paper for use in their regular production. And many promising trials are still ongoing at other paper producers.

Encouraged by this success, Archroma has continuously extended its portfolio of concentrated OBAs over the past three years. The company launched several new concentrated products to supply the other regions and cover the most important application areas. These products include: disulphonated Leucophor® ALC liq, tetrasulphonated Leucophor® T-125 liq, hexasulphonated Leucophor® SKC liq and hexasulphonated Leucophor® STR liq. Today Archroma produces concentrated OBAs in its plants of Resende (Brazil), Martin, South Carolina (United States), and Prat de Llobregat (Spain) as the market trends towards concentrated products.

Substantial benefits for paper makers beyond reduced transport costs

While reduced transport costs and related CO₂ emissions are obvious benefits for paper makers, concentrated optical brightening agents also offer many more advantages compared to conventional products. Customers need significantly less storage space for such materials at their sites, allowing them either to store more of the same product or to use precious storage space for something else. The need for fewer deliveries also improves handling efficiency on site and reduces the risk of potential mistakes and spills during offloading.

The new chemistry also generates new opportunities for application cost savings. From an efficiency perspective, paper makers will benefit from using less active agent whilst achieving good brightness or whiteness for their application. The highly substantive, ultra-concentrated stilbene brightener Leucophor® ACK liq is an excellent illustration, as it

exhibits impressively high build up, even at extremely low concentrations, thanks to its strength and high affinity to the paper fiber.

Compared to current disulphonated chemistries, Leucophor® ACK shows improved performance on stock addition to both virgin and recycled fiber, and in pigmented coating applications, particularly those containing PVOH as a secondary binder. It also allows greater flexibility and higher solids contents in CMC and starch/CMC pigmented coatings. And despite their higher concentration, these products have excellent storage stability and remain free-flowing at room temperature.

A recent trial at a European producer of high-white-grade office paper demonstrated that the mill could save an estimated USD 150,000 annually by switching from a conventional OBA to a concentrated disulphonated product (keeping runnability and whiteness level of 170 CIE constant).

Besides state-of-the-art effectiveness, concentrated OBAs also are satisfying the most demanding environmental requirements. As an example, Leucophor® ACK is REACH registered and fulfils the requirements of Nordic Swan, EU Eco Flower and BfR (Bundesamt für Risikobewertung).

Continuously innovating around concentrates

With the aim of offering customers further innovations in the area of concentrated OBAs, Archroma's research and development team based in Reinach, Switzerland, is continuously testing new concepts and developing new products.

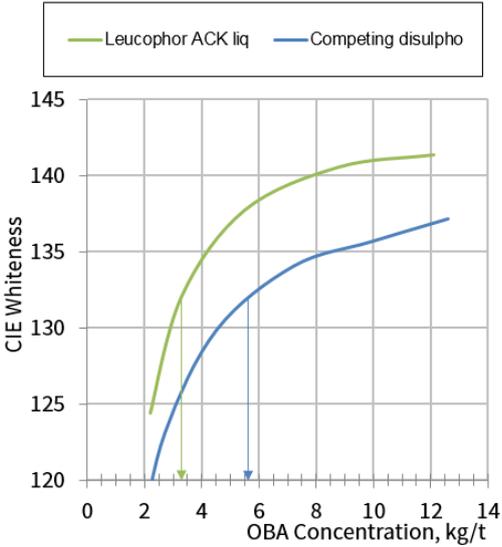
In April 2016, Archroma launched its ADVANCED WHITENING concept, integrating the use of concentrates and bringing their application benefits to a higher level. This two-component package combines the use of Leucophor® products with a newly launched surface shading dye called Cartawhite® XL liq.

Based on five years of research and development, this new, patent-pending concept allows users to optimize both OBA and shading components when producing their printing, writing and office papers. By allowing the separate dosing of these two components (OBA and shading dye), ADVANCED WHITENING provides paper makers with the means to reduce their whiteness costs across all grades. In addition, the concept shows good compatibility with size-press and coating systems, and reduces two-sidedness compared with 100% pigment shading systems.

Last but not least, in June 2016 Archroma launched Leucophor® ACS liq, a concentrated, urea-containing, disulphonated OBA that had been missing for paper makers in the European market. This product is particularly suited for stock application and for use in coating formulations that contain PVOH, CMC or casein as a secondary binder. With this

latest product launch, Archroma is complementing its range and further strengthening its position as the expert in concentrated optical brightening agents.

Illustrations:



Left: Size press application of Advanced Whitening Concept using concentrated OBAs

Right: Wet-end application of Leucophor ACK liq on fully-bleached Kraft fibre – Comparison of Whiteness Built-Up. Users typically can expect a 35% reduction in OBA demand by switching to Leucophor ACK.