

OPTICAL BRIGHTENERS FOR PAPER

Also known as Fluorescent Whitening Agents (FWA's), Optical Brightening Agents (OBA's), are organic compounds derived from stilbenic acid, they are used to enhance the visual brightness in any type of white paper.

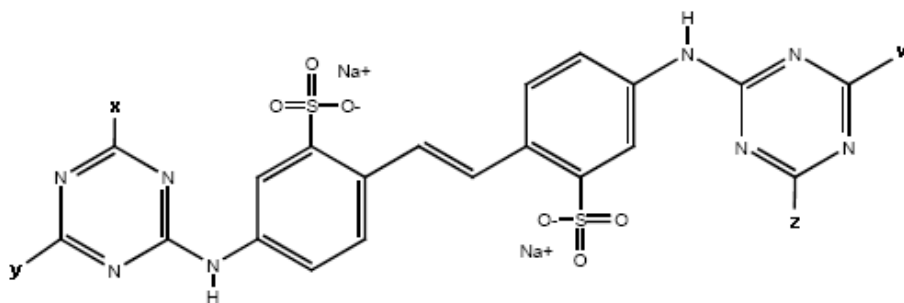
Optical Brighteners for Paper absorb the light in the ultraviolet range of the spectrum (under 370 nm) and re-emit this light in the visible range (435 nm) giving a fluorescent effect that produces better brightness and whiteness of paper.

According to their application, Optical Brighteners for Paper can be classified into three big groups:

- **Disulfonate:** only used in mass
- **Tetrasulfonate:** used in both the mass and size press.
- **Hexasulfonate:** mainly as a coating in size press section of machine.

Properties

<i>Appearance:</i>	Yellowish brown to reddish liquid.
<i>Chemical nature:</i>	4,4' diamine, stilbene 2,2' disulfonic acid, derivative.
<i>Ionic character:</i>	Anionic
<i>Solubility:</i>	Miscible in water.
<i>Standard Chemical Structure:</i>	



x, y, w, z: Various ending groups

For example:

x, w: -R \Rightarrow (2 sulfo groups.- disulfonate)
x, w: -R-SO₃Na \Rightarrow (4 sulfo groups.- tetrasulfonate)

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Application

In furnish, **Optical Brighteners for Paper** may be used to give brightness in all type of sized or coating papers. Their good acid and sizing agent fastness ensures a perfect process even at low pH. **Optical Brighteners for Paper** are particularly effective for coated papers with CaCO_3 .

Optical Brighteners for Paper should be diluted before use, however, because of their good solubility they also may be sprayed directly into the pulper or into the machine chest provided if it is possible, of a vigorous mixing, or pump suction, specially disulfonate and tetrasulfonate types. To achieve an optimum brightness in sized papers it is admissible to add optical brighteners before aluminum sulfate and any other cationic additive.

Acid Fastness

Optical Brighteners for Paper have good acid fastness. It is possible to get good brightening effects upward pH 4, including with high doses. This data only apply when the aluminum ions concentration in white water is not higher, and it can be used with recycled water.

Surface Sizing

Optical Brighteners for Paper are suitable to be used with surface sizing with starch. The effects may be enhanced dosing a little quantity of CMC at the starch solution.

Recommendation for papers with high grade papers:

The main factor which affect the use of Optical Brightening Agents for coating paint is the hydrophilic co-binder content which help and act as stabilizer for optical brightening agents, like:

- Polyvinyl Alcohol(PVA)
- Carboximethyl Cellulose
- Melamine Formaldehyde Resins
- Polyglycols
- Polyacrylates
- Starch
- Casein

The following problems may be when the co-binder content is lower:

- Low bright
- Low darkening limit
- Low effectiveness of optical brighteners.

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FDA Regulations

Optical Brighteners for Paper may be used as additives in the manufacture of paper and board for packaging in contact with aqueous and fatty foodstuffs (21 CFR 176.170(A)), which is FDA approved.

Toxicology

The toxicological assays obtained with **Optical Brighteners for Paper** show that the products is not a health hazardous matter. The trials include an acknowledgment of tolerability in skin mucous membranes and sensitive areas. The normally found quantities in the effluent do not damage fishes. Similarly, they do not inhibit the activated mood functions in biological water treatment plants.

Packaging and Storage

Optical Brighteners for Paper are not classified as hazardous. These products should be stored in fresh areas, where there is any direct contact with sunlight. Avoid store with foodstuffs.

Packing: 1,000 Kg containers and 20,000 Kg. pipe truck.

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