



Paramount Minerals and Chemicals Limited

(An ISO 9001- 2000 Certified Company)

Parawhite VSI-AF Liquid

Chemical Description	Tetrasulphonic Derivative of 4,4'-diamino-stilbene-2,2'-disulphonic acid
Ionicity	Anionic
Shade	Bluish, virtually neutral white
Substantivity	Good
Form supplied	Clear Yellow to Brownish liquid
Density at 25 deg C	1.08-1.15 g/cm cube
pH value 1% aqueous solution at 25-30 deg C.	8.0-9.50
Acid resistance	Good
Miscibility at 10 deg C. and above	Can be mixed with water in all proportions
Viscosity at 25 Deg C	Lower than 50 mPa.s
Storage stability	2 years. Parawhite VSI-AF Liquid is stable at temperatures above 0 deg C. At temperatures of less than 0 deg C. precipitation may occur, but the precipitate dissolves again on heating. This does not impair the effectiveness of the product.
Recommended for Use	In the pulp for sized and filled papers. Surface application in the size or film press. Use in coatings containing carriers.

Uses

Fluorescent whitening in the pulp

In sized, unfilled and filled papers and boards at pH 4.5-9. In unsized papers, provided water hardness is above 100 ppm or more.

Fluorescent Whitening at the size press

In size press liquors based on solubilized starches, and in combination with CMC,PVA and alginates.

To obtain the best possible results with Parawhite VSI-AF Liquid , the base papers should be produced at pH not lower than 5.

Fluorescent whitening in coating application

In coating mixes containing combinations of natural and synthetic binders and the usual pigments at pH 7-11 for low to medium whiteness. The effects of Parawhite VSI-AF Liquid and other comparable fluorescent whitening agents is largely dependent on the type and amount of co-binder used, such as CMC,PVA, etc.

Fastness Properties

The product's light fastness properties and stability to acids and alkalis are comparable with those of other fluorescent whitening agents with the same chemical constitution.

Ecology/toxicology

The usual hygiene and safety rules for handling chemicals must be observed in storage, handling and use.

Median lethal dose in rats (LD50) is above 5000 mg/kg body weight. Tests with rabbits showed no irritant effect on the skin or mucous membranes.

Fluorescent Whitening in the Pulp

Parawhite VSI-AF Liquid can be dispensed batchwise in the pulper or the mixing chest. If mixed thoroughly enough with the pulp, Parawhite VSI-AF Liquid does not require diluting.

Care must be taken that the product is applied before and not together with either alum or cationic auxiliaries.

Parawhite VSI-AF Liquid can also be dispensed continuously in stock solutions or undiluted at suitable points in the stock preparation system.

Although Parawhite VSI-AF Liquid has medium to high affinity for cellulose, the whiteness depends on the uptake time and the consistency of the pulp. The best effect is obtained if the product is dispensed at a point where the pulp is of high consistency. This is particularly important if soft water is being used.

Required amount

0.05-1.5% Parawhite VSI-AF Liquid , based on bone dry cellulose/pulp.

Maximum amount

1.5%

Fluorescent Whitening at the size press

Parawhite VSI-AF Liquid promotes uniform fluorescent whitening with the conventional starch qualities used at the size press. It can be used together with CMC, PVA and anionic and weakly cationic synthetic sizing agents. Its effectiveness is influenced by the pH of the base paper. The best effects are obtained if the pH in the head box is above 5.

If the pH is below 5.0 we recommend using Parawhite BF Liquid

It is preferable to add Parawhite VSI-AF Liquid undiluted to the ready-prepared size-press liquor.

Required amount

0.5-15 g/l size-press liquor

In special cases e.g low starch uptake due to equipment, amounts may be increased to 25 g/l.

Combining fluorescent whitening of paper both in the pulp and at the size press usually ensures greater cost effectiveness.

Fluorescent whitening of coating mixes

Fluorescent whitening agents belonging to the Diamino Stilbene Disulphonic Acid derivative class have insufficient affinity for coating pigments and synthetic latices based on co-polymers of acrylic acid ester and butadiene styrene. To obtain the best effects from fluorescent whitening agents, carriers or co-binders as they are also called are, therefore, indispensable.

Carriers suitable for Parawhite VSI-AF Liquid are (in the order of decreasing effectiveness) PVA,CMC, starch and synthetic co-binders.

The best effects of Parawhite VSI-AF Liquid are obtained with the following amounts of co-binders, referred to the coating pigment:

PVA	2.5 parts
CMC	1.5 parts
Starch	4 parts
co-binder	1.5 parts (calculated on the solids content)

In production, the co-binder cannot always be used in amounts that promote the most favourable effects of the fluorescent whitening agent owing to their impact on flow properties and printability. In such cases a compromise must be sought.

To a limited degree, crosslinking agents based on melamine formaldehyde and urea formaldehyde are effective as carriers for fluorescent whitening agents.

Parawhite VSI-AF Liquid is of limited suitability as a co-binder in combination with casein and protein.

Parawhite VSI-AF Liquid does not affect the flow properties of different coating compounds and can be used at pH 7-11.

Parawhite VSI-AF Liquid can be added undiluted at almost any stage in the preparation of coating compounds.

Required amount

0.2-1.2% based on the coating pigment

Maximum amount

2.0% based on the coating pigment

To obtain very high white we recommend our special Parawhite products.