

BILMINE LIQUID DYES

Bilmine Liquid Dyes are usually sodium salts of azo dyes, which contain several sulphonic or carboxyl groups in order to increase solubility of the dye molecule.

Generally speaking this dye group is noted for its good affinity for furnishes used in papermaking. This coupled with their generally good to very good fastness to light, bleeding and chemicals, makes Bilmine Liquid dyes suitable for the following applications:

- Dyeing – writing and printing papers, hygiene papers, board, corrugated case materials, special papers
- Shading white and fluorescent whitened writing & printing papers

BILMINE LIQUID DYES ARE ANIONIC IN NATURE

Storage

- The dyes should ideally be stored at room temperature.
- If frozen, because they have been stored at a temperature below 0°C, they should be thawed slowly and stirred if necessary.

Stock Solutions

Stock solutions should be made up with soft water only. If no soft water is available, the stability of stock solutions can be tested in the laboratory after ascertaining the available water quality. If stock solutions are unstable on account of hard water, stability can be improved by a sequestrant, (Preliminary trials in the laboratory are required). Stock solution containers must be thoroughly cleaned with water before re-use to avoid bacterial growth.

APPLICATION RECOMMENDATIONS :

Anionic Dyes

These are especially suitable for dyeing wood-free papers and those containing small amounts of wood. In batch wise dyeing, anionic dyes should be added as early as possible, while allowing sufficient time for uptake by the stock. Sizes and other process chemicals should preferably be added after the dyes.

Fixatives can normally be added at the end, if possible continuously and shortly before the head box. Fixatives are recommended for the deep shades like Red. Excessive amounts of aluminium sulphate, fixatives or other paper auxiliaries should be avoided.

Cationic Dyes

Before adding these dyes, it is advisable to neutralize troublesome anionic trash with cationic fixatives or aluminium sulphate. Cationic dyes are highly suitable for continuous application on account of their positive charge and associated more rapid uptake.

Stock Addition

To avoid mottling, care should be taken to ensure rapid, thorough mixing with the stock. Careful preliminary diluting reduces the tendency to mottling. In continuous addition, the dye should be diluted with fresh water (constant pressure) shortly before addition. Agitation of the stock should be vigorous to ensure rapid, thorough mixing. To avoid trouble when adding, it is advisable to place a strainer with a large surface in front of the dispensing equipment. The dispensing pump should be thoroughly rinsed each time the shade is changed. Old stock solutions can cause dispensing problems if not filtered and they should be checked before use.

Mixing of Dyes

Anionic dyes can generally be mixed, at any rate shortly before addition to the stock (e.g. via manifold.) Although the dyes have the same ionic character, different formulations can result in instability. Cationic dyes can generally also be mixed shortly before addition to the stock. Here, too, instability can result from different formulations.

Anionic and Cationic Dyes should never be mixed as this will lead to precipitation.

If anionic and cationic dyes are used in combination, they must be applied at a separate time and place and via separate lines. Anionic dyes and cationic auxiliaries (fixative, wet strength resin or retention aid) should not be added at the same time. Similarly cationic dyes and anionic auxiliaries should not be applied together.

PROPERTIES OF THE COLOURANTS

Backwater Colouration

Grayscale: 1 = Marked Colouration, 5 = Colourless
Unsize (for information on affinity for the fibre) and pseudo neutral sized (fixation by aluminium sulphate) papers were tested. In pseudo neutral sizing, the dissolved, unfixed anionic dye is precipitated in the stock mixture by the aluminium sulphate addition. The resulting colour precipitates must be retained on the paper machine during sheet formation. However, the backwater is usually clear. High pigment build-up can increase coloured two-sidedness in bulk working.

Light Fastness

Light fastness (Xenotest) is tested on sized papers at 0.2RD in accordance with ISO 105-B02 (under normal conditions) and assessed against the blue scale, which is exposed to light at the same time.

1 = poor, 8 = outstanding

BLEACHABILITY

Oxidation

The stock is dyed & then poured into a plastic vessel and heated in a water bath, to 30°C. Borax and sodium hypochlorite are added (2% chlorine the weight of dry pulp) and the vessel is closed. After 10 minutes at 30°C, the pH is adjusted to 8 with aluminium sulphate and the stock bleached for further 20 minutes. The preparation is shaken at regular intervals. Any remaining chlorine is then neutralized by an addition of sodium thio sulphate. After sheet formation and drying, loss of colour strength is determined by comparison with the untreated, dyed control.

Reduction (Hydrosulphite)

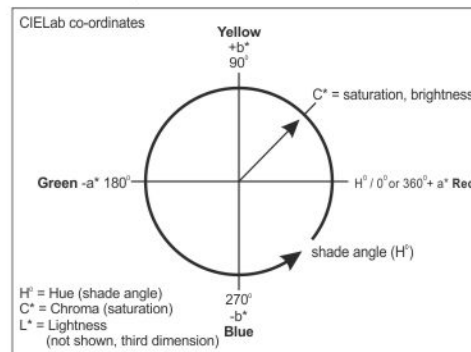
The stock is dyed then poured into a plastic vessel and heated to 50°C in a water bath. Borax and sodium hydrosulphite (0.66% analytical grade borax, 1% sodium hydrosulphite 85% on the weight of dry pulp) are then added. The vessel is closed and left to stand for 45 minutes at 50°C in the water bath, during which period it is shaken several times. After sheet formation and drying, loss of colour strength is determined by comparison with the untreated, dyed control.

Assessment of bleachability:

1 = not bleachable, 5 = sample almost white highly bleachable.

CIELab Colour Chart

The CIELab Colour Chart in the pattern card show how the dyes are colorimetrically classified in the systems mentioned. The colour co-ordinates depend on the shade depth.



CIELab Colour Chart shows our range of the colours for paper

BIPIL



BILMINE LIQUID DYES

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*Colours shown are for indicative purpose only. Please contact laboratory for actual colours.

BILMINE LIQUID DYES		PHYSICAL DATA			FASTNESS PROPERTIES		
		DENSITY ca.g/cm ³	PH UNDILUTED	VISCOSITY 25°C mpa.s.	LIGHT	WATER	BACK WATER
Bilmine Yellow G	1.0-1.2	9.5-10.5	<=100	5	4	4-5	
Bilmine Yellow 3GF	1.0-1.2	9.5-10.5	<=100	4-5	4-5	4-5	
Bil. Brill. Paper Yellow R	1.0-1.2	8.5-9.5	<=100	5	4-5	4-5	
Bil. Brill. Paper Yellow G	1.0-1.2	8.5-9.5	<=100	4-5	4	4-5	
Bilmine Fast Orange LD	1.0-1.2	10.0-11.0	<=100	4-5	4	4-5	
Bilmine Orange 7G	1.0-1.2	9.5-10.5	<=100	4-5	4	4-5	
Bilmine Brill. Orange 2R	1.0-1.2	9.5-10.5	<=100	4-5	4	4-5	
Bilmine Red 8BN	1.0-1.2	10.0-11.0	<=100	4-5	4	4-5	
Bilmine Red 4BN	1.0-1.2	10.0-11.0	<=100	4-5	4	4-5	
Bilmine Fast Red B	1.0-1.2	9.0-10.0	<=100	4-5	4	4-5	
Bilmine Fast Red 5B	1.0-1.2	9.5-10.5	<=100	4-5	4	4-5	
Bilmine Turq. Blue G	1.0-1.2	9.5-10.5	<=100	4-5	4	4-5	
Bilmine Turq. Blue BL	1.0-1.2	7.0-8.0	<=100	4-5	4	4-5	
Bilmine Blue 2RR	1.0-1.2	8.5-9.5	<=100	4-5	4	4-5	
Bilmine Brill. Blue F	1.0-1.2	9.5-10.5	<=100	4-5	4	4-5	
Bilmine Blue 2RA	1.0-1.2	8.5-9.5	<=100	4-5	4	4-5	
Bilmine Blue 3B R	1.0-1.2	9.5-10.5	<=100	4-5	4	4-5	
Bilmine Blue 3B G	1.0-1.2	9.5-10.5	<=100	4-5	4	4-5	
Bilmine Brown NB	1.0-1.2	10.0-11.0	<=100	4	3-4	3-4	
Bilmine Violet BB	1.0-1.2	8.5-9.5	<=100	4	3-4	3-4	
Bilmine Paper Violet BL	1.0-1.2	8.5-9.5	<=100	4	3-4	3-4	
Bilmine Black 5B	1.0-1.2	8.5-9.5	<=100	4	3-4	3-4	
Bilmine Black VG	1.0-1.2	8.5-9.5	<=100	4	3-4	3-4	
Bilmine Black E-SE	1.0-1.2	8.5-9.5	<=100	4	3-4	3-4	

Disclaimer : The information provided in the shade card are for the guidance of the user. Responsibility lies with the user to test and verify before use.

APPLICATION TECHNIQUES

Batch wise Dyeing

To improve shade consistency dyes should always be added to the stock in the same order (e.g. yellow, red, blue). Changes in the order of addition may cause shade variation. To achieve the best dyeing costs, the uptake time should be as long as possible and the dyes thoroughly mixed with the stock. Cationic products (aluminium sulphate, fixatives, etc.) are best added as late as possible.

Continuous Dyeing

Pale and medium shades are mainly dyed continuously. The dyes should be dispensed as early as possible in the level box or mixing pump. It is essential that no dyed stocks passes back into the machine chest. Only dyes with good affinity should be used for continuous dyeing. When using anionic and cationic dyes in the same recipe, we recommend normally adding the anionic dye first. These dyes must always be dispensed at different times and points.

The approach offers the following benefits:

- Quick shade changes and corrections
- Deep shades attainable
- Long contact time
- Dyes with lower affinity can be used
- Less fixing agent necessary
- Less "off shade" production throughout a run

Surface Colouration

Various paper grades can and are using Bilmine Liquid Dyes on the surface be it in the sizepress (most common), in a dip dye batch or printing applications. Surface colouration at the sizepress is not widespread, however, this approach can be used to achieve special effects/cost reductions in deep shades or for correcting colour two-sidedness. Adding colour to the surface of paper results in the following:

- Economical benefits - Due to reduced dyeing costs particularly on heavier weight grades
- Productivity benefits - Due to quicker shade changes and an almost white (except broke) wet end system
- Ecological benefits - Due to cleaner backwaters and cleaner waste water systems. With this approach careful consideration should be given to the impact on bleed fastness and sheet appearance.

Split Dyeing (Continuous/Surface)

For medium to deep shades, in order to accomplish quick shade adjustments, maintain flexibility in shade control and achieve brighter shades, the combination of two dyeing methods continuous wet end addition and sizepress colouration can be applied. It is quite possible that up to 80% of the colour can be added to the sizepress, with the remainder being added continuously prior to the headbox for shade control. This approach offers the following benefits:

- Correction of colour two-sidedness.
- Improved sheet appearance
- Reduces a "white" edging effect

With all surface colouration applications it is strongly recommended to carry out compatibility checks with the carrier chemical (e.g. starch) prior to any machine trials. With this approach careful consideration should be given to the impact on bleed fastness and sheet appearance.