

PRINTING ON POLYESTER

Printing on polyester is a specialised subject that needs elaborate study. Polyester can be printed with the following class of dyestuffs:

- Indigo sol colours
- Pigment dyes
- Disperse dyes

Disperse printing of polyester consists of following fundamental principles:

- Thickener - acid stable
- Disperse dyes
- An acid donor or catalyst
- An auxiliary to enhance the dye uptake as and when required

The methods of fixation after printing and drying are:

- Pressure steam fixation method
- High temperature steam fixation method
- Thermo fixation method

Thickening agent is the most important component of the printing paste and it should be cost effective. The fact is that since the printing paste is acidic the thickener should have very good stability in the pH range of 2-5 for long time. The most favoured thickener the world over is guar gum. Others include:

- Modified guar gum
- Carboxyl methyl cellulose
- Sodium alginate
- Synthetic thickeners based on polymeric organic compounds

The disperse dyes usually become dull under alkaline conditions. To improve this, the pH of the print paste is controlled to pH of 4.5-5 by addition of citric or tartaric acid - the more common being citric acid. However, tartaric acid is selective in some real cases where the acidic conditions are more stable than citric acid.

Problems:

- Splashing printing paste during printing due to vibration of blotting paper
- Sticking and threading property of gum when screen is lifted causes sharp lines losing their sharpness
- Yellowing and uneven prints of the printed fabric cloth causing poor sharpness, brightness, colour value
- Bleeding at the time of printing and steaming, caused by the use of excess urea. Coarse screen mesh and excess dyestuffs may cause bleeding as well

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Technical Tuesdays

- Changing tone due to high time lapse between printing and drying. Improper heating in the ager also results in tone variation due to uneven diffusion of disperse dyes
- Hallowing/ mark off due to sublimation of disperse dyes having low sublimation fastness
- Changing colour value due to incompatibility of dye combinations. The presence of impurities in water like calcium, magnesium and iron forms a complex with the dyestuffs, lowering the colour value and giving a dull effect
- Staining during after treatment if proper sequence of rinsing is not followed, because superfluous disperse dyes get redeposited on the unprinted cloth during hot water rinsing

Remedies:

- Proper viscosity of print paste. Guar gum and its percentage with proper cooking method will eliminate the splashing problem. A gum paste having higher solid content and certain plasticity is recommended
- Fabric should be free from auxiliaries like size, coning oil, non-ionic emulsifiers and cotton impurities, to eliminate the problem of yellowing and uneven prints of printed fabric
- Selecting suitable thickener, moderate strength of the dyestuffs, appropriate dosage and small motifs in printing excludes bleeding. Low viscosity of paste may cause bleeding
- Tone change can be eliminated by uniform heating and quick drying. Auxiliaries, like print developer TX, have a synergistic action on the different types of dyes used in mixing and brings about synchronization of diffusion rates of individual dyes
- Hallowing/ mark off can be negated by selecting proper dyes and good quality wrapper (cotton wrapper) for pressure aging
- Colour value change can be barred by maintaining appropriate pH of 5-6. Compatibility of dyes i.e. having diffusion temperature in the same range is selected. Use of sequestering agent in print paste is important or else usage of soft water is emphasized
- After-treatment staining is reduced by following the sequence of: Cold wash -> Reduction -> Hot water -> Soaping -> Clearing->Rinsing
- Using a good auxiliary like catalyst PC helps in removal and destroying unfixed superfluous disperse dyes and also helps in breaking baked-dried film of printing gum faster

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