

## Pigment emulsions - the heart of quality pigment printing on textile fabric

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IN pigment printing, water insoluble pigments are applied onto textiles which do not have any affinity to the substrate. Therefore the pigments are applied together with a printing system which 'glues' the pigments onto the substrate

Although printing of textiles using engraved wooden blocks were practiced in Germany and France in the early 15th century, mechanized printing took birth in 1783 when James Bell, a Scotsman invented engraved roller printing.

The modern textile printing techniques using flat bed and rotary screens generally referred to as 'wet printing techniques' have given impetus to tremendous growth for the textile printing industry over the years

The wet printing process follows the below mentioned steps in the printing of textiles. The starting point as in dyeing of textiles is to provide well pretreated fabrics so that the subsequent processes result in good quality output:

1. Preparation of print paste
2. Printing of fabric
3. Drying of the printed fabric
4. Curing or fixation of the printed dye or pigment
5. After-washing (in case of printing with dyes)

Today over 65% of printing globally is done on cellulose out of which 50% is done on cotton textiles. 50% of printing globally is done using pigments while 25% is done using reactive dyes. In every continent in the world, pigment printing plays a dominant role. 40% of all printing in Asia, 50% in Europe and 85% in Americas are done using pigments.

Although Pigment printing and printing with reactive dyes have their own advantages, the major shortcoming of 'rough feel' encountered using pigment-binder system has been overcome using soft binders and other additives which give similar feel as compared to fabric printed with reactive dyes.

Pigment printing scores over printing with reactive and other dyes on the following parameters:

1. Number of process steps involved
2. Ease and robustness of process
3. Suitability to print on different substrates
4. Possibility of different styles of printing like direct, resist, discharge and special effects

5. Lower energy consumption
6. Lower emissions
7. Lesser use of resources like time, water, energy and manpower
8. Lower effluent load
9. Lower investment in machinery
10. Lower cost of printing

It is for these reasons that pigment printing is gaining importance rapidly in printing of textiles.

Preparation of pigment print paste is the first step in the process of printing textiles using pigments as colorant. The Print paste is usually composed of a binder to fix the pigment on to the fabric, synthetic thickener, de-foamer, fixing agent and handle modifiers.

The printed goods are tested these days for the following application properties:

1. Fastness to Light
2. Fastness to rubbing (dry and wet)
3. Fastness to washing
4. Fastness to chlorinated water
5. Fastness to dry cleaning
6. Fastness to perspiration
7. Fastness to PVC migration
8. Hot air (heat) stability
9. Discharge stability

In addition the printed goods should conform to the following ecological parameters. They should:

1. Be APEO / NPEO / OPEO ( Alkyl, Nonyl and Octyl Phenol Ethoxylates ) free
2. Be OPP ( Ortho phenyl phenol ) free
3. Be ( extractive ) Heavy metals free
4. Be Phthalate free
5. Be PCP / TeCP free ( Pentachlorophenol / Tetrachlorophenol ) free
6. Be PCB / PCT ( Polychlorinated Biphenyls / Terphenyls ) free
7. Be Chlorinated Benzene free
8. Be Poly aromatic hydrocarbon ( PAH ) free
9. Be Dioxins / furans free
10. Maintain formaldehyde within prescribed limits of upto 75 ppm ; upto 20 ppm for baby wear
11. Not have substances like Organotins in Biocides

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Pigment emulsions based on the same Color Index number may vary widely on the following attributes :

1. Pigment particle size uniformity
2. Structure of pigment crystals
3. Pigment dispersion behavior ( tendency to agglomerate )
4. Flow property
5. Drying behavior
6. Gelling in water based printing system
7. Hue and strength
8. Batch to batch variation
9. Laboratory to bulk reproducibility
10. Ecological parameters

The manufacture of pigment emulsions requires modern

machinery with constant checks at all stages to comply with the stringent requirements mentioned above. Therefore getting the entire color range of pigment emulsions from a reliable source at reasonable price is always a challenge to the textile printing industry.

Leomine Organics Pvt Ltd. with its extensive knowledge on the subject and modern production facilities offer an entire range of high quality pigment emulsions under the brand name Leomine PD that fulfill the above mentioned requirements of the industry in terms of technical and ecological aspects at attractive prices thus giving its customers 'peace of mind' once they make the purchase. ■