PRINTING – PART VI

REF: TT/ JUNE 2021/ WK 3

B) Pigment Printing (Continued...)

A pigment printing system mainly consists of three components - Pigment, Binder and Thickeners. Other than that different printing auxiliaries are also used.

1) **Pigment** - A pigment is a colored material which is insoluble in water and are applied as dispersion and not as solutions. Pigment changes the color of reflected or transmitted light as a result of wavelength-selective absorption. Or it can be said that pigment is a substance that appears a certain color because it selectively absorbs certain wavelength of light.

   Types of Pigments - Pigments can be classified into two types: inorganic pigments and organic pigments.
   Organic Pigments - This type of pigments occurs naturally and earlier these pigments were being used. Compared to inorganic pigments, the usage of these pigments is less. These pigments are used when the required color strength or depth of shade is not too much.
   Inorganic Pigments - These are synthetic pigments. Inorganic pigments also include white opaque pigments which are commonly used to lighten other colors and also to provide opacity or dullness.
   Two other types of pigments are metallic pigments and industrial pigments.
   Examples of metallic pigments are Zinc, Aluminum pigments etc. While industrial pigments are the pigments that are widely used in the industrial applications and include organic, inorganic and the metallic pigments.
   Pigments for textiles have no intrinsic substantivity or affinity for fibers and are not generally found in solution form but in the form of very finely divided water dispersible particles which have a surface negative charge. The charge is due to the attraction of the hydrophobic tails of anionic dispersant molecules for the surface of the particles, while their hydrophilic anionic (negatively charged) heads project into any water surrounding the particles.
2) **Binders** - Binders are adhesive type coating forming polymeric materials which sticks pigment particles on fiber surface. Binders are white, milk-like liquid. They are monomers which on heating get converted into polymers. Binders form film which is soft, transparent and difficult to see but can be felt its harshness on the fabric. That is why pigment printed fabric have more harshness when compared to other printing techniques. Binder forms a very thin invisible film on fabric surface during curing. Under this film, pigment particles are stuck. Binder actually holds the

pigment color and sandwich it between fabric surface and coating and this coating help color to stick there. Maximum of pigment is entrapped in between so vigorous washing after printing is not required as it was required in case of reactive printing to wash off unfixed dye. This is big advantage of pigment over other techniques which make it economical.

Characteristics of binders used in pigment printing

- Binder should not get coagulated due to shear forces operating during printing. If coagulation takes place clogging of the screen and blocking of the engravings of the printing rollers take place during the actual printing.
- The binder film must be clear, of even thickness, smooth, and neither too hard not soft.
- It should be elastic in nature
- Should have good adhesion to the substrate.
- It should have good resistance to chemical and mechanical stresses and should be readily removable from the engravings of the printing rollers, screens, back grays and blankets.
- Good binders must be colorless, odorless compounds that are easily and smoothly dispersed in print pastes without adversely affecting the viscosity.
- Should be easily removed from printing equipment, such as screens and rollers.
- Binders should form flexible films that encapsulate pigment particles and adhere to fabrics without swelling during laundering and dry cleaning.
- Textile binders must be stable to outside forces that would tend to dislodge the pigment from the textile substrate, such as washing or rubbing.

References:

1. https://fiberseal.com/
2. https://www.indiantextilemagazine.in/
3. https://www.hilarispublisher.com/
4. https://www.thoughtco.com/

.....To be continued.....

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Last week`s Answers: 1) APPLICABLE 2) MECHANISM 3) RUBBING 4) INSOLUBLE

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