TECHNICAL TUESDAYS

PINHOLE DAMAGE – CAUSES AND REMEDIES

REF: TT/ OCTOBER 2019 / WK 4

What is Pinhole damage?

Pin holes – as the name says it's a pin-sized damage on the fabric. This is a fabric defect which becomes a major one when the frequency of pinhole increases.

Fig 1.1 Pinhole Damage

Causes of Pinhole damage

1) **During manufacturing of fabric** - Pinhole damage is caused by pins/sharp objects of the machine. Mainly these pin holes are generated during weaving in the fabric. The holes created during fabric manufacturing are many times not visible during grey fabric inspection.
   - The slippage occurs between weaving machine roller and fabric. This slippage causes a rupture in the warp or weft in the fabric at many places. This yarn rupture results in the form of pinholes in the fabric.
   - If warp or weft yarn has high thin places, then there is always a chance of broken warp or weft for very small length. These threads are broken in the fabric after weaving due to jerk creating during shedding or beating causing pinholes.
   - When the fabric passes under tension during processing, the yarn at thin places breaks and pinholes appears on the fabric surface.

2) **During processing of fabric –** Pinhole damage is also caused due to localized fiber degradation.
   - This happens by hydrogen peroxide catalyzed by metal ions like iron, zinc and copper. These metal ions come from various sources. They are present in water supply. Iron may come from the rust of water and steam supply lines. When wet fabric comes in contact with rusted machinery parts, iron passes onto the fabric. Metal ions are also embedded into the fiber.
   - Due to improper filtration of caustic solution during scouring.
   - Excessive fabric tension during processing on jigger machine or the stenter machine also causes pinhole in the fabric.

Remedies of Pinhole damage caused during wet processing

- Demineralization – This is done to remove metal impurities from fabric. The free metal or its oxide is converted into soluble metal ion. This is then followed by chelation. The metal ion in solution is chelated and inactivated hence does not interfere in bleaching.

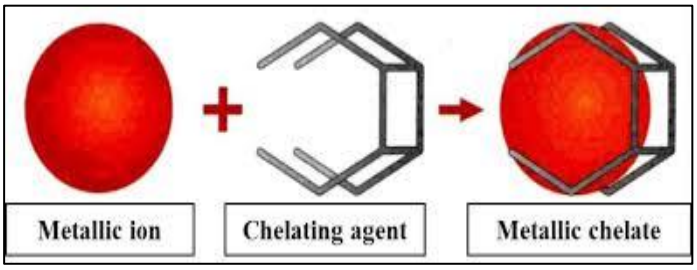

Fig 1.2 Mechanism of Chelation

- Water is properly treated to remove metal contaminants.
- Use of appropriate stabilizers and sequestering agent is necessary.

Wishing you a great week ahead!

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