

ANTISTATIC FINISH – PART I

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What is an Antistatic Finish

During different processes like spinning, weaving etc. friction is generated in textile fibers because of rubbing. This develops static charges in hydrophobic fibers. The shocks are experienced during processing on machines. Therefore, to avoid the static charges, the fabrics are treated with finishing agents. These finishes are called **Antistatic Finish**.



Types of Antistatic finish.

- 1) Non-durable finish
- 2) Durable finish

Non-durable finish

Non- durable antistatic agents are generally for fiber and yarn processing finishes. These finishing chemicals are hygroscopic materials, which includes surfactants, organic salts, glycols, polyethylene glycols, polyelectrolyte, quaternary ammonium salts with fatty alkyl chains, polyethylene oxide compounds and esters of salts of alkyl phosphonium acids.

The general requirements for non-durable antistatic agents are:

- Low volatility
- Low flammability
- Non-yellowing
- Non-corrosive
- Low foaming

Durable Antistatic Finish

The basic principles to form durable antistatic finishes are:

- To form a crosslinked polymer network containing hydrophilic groups.
- The amount of hydrophilic character in the final polymer can be varied to meet individual requirements.



Mechanism of Antistatic Finishes

The principle mechanisms of antistatic finishes are increasing the conductivity of fiber surface and reducing frictional forces through lubrication. Increasing conductivity produces a lower charge buildup and a more rapid dissipation while increased lubricity decreases the initial charge buildup.

Antistatic agents that increase fiber surface conductivity form an intermediate layer on the surface. This layer is typically hygroscopic. The increased moisture content leads to higher conductivity. The presence of mobile ions on the surface is very important for increased conductivity. The effectiveness of hygroscopic antistatic finishes depends greatly on the humidity of the surrounding air during actual use. Lower humidity leads to lower conductivity (higher resistance) and greater problems with static electricity.

Most non-polymeric antistatic finishes are also surfactants.

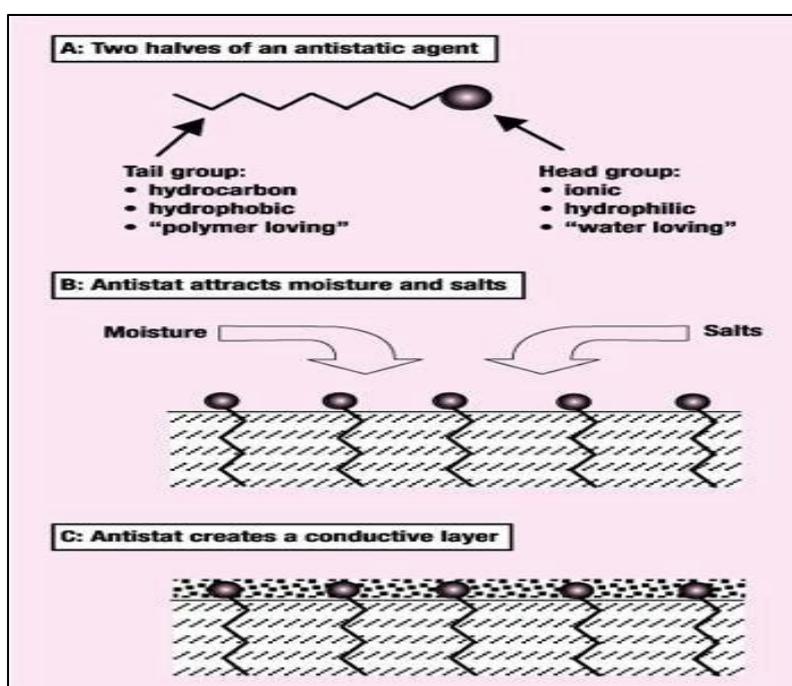


Fig 1.1 Mechanism of Antistatic finish

To be continued...

Wishing you a great week ahead!

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