Topic: PLASMA TECHNOLOGY

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Content:

What Is Plasma?

The plasma is an ionized gas with equal density of positive and negative charges which exist over an extremely wide range of temperature and pressure.

Plasma technology is based on a simple physical principle. Matter changes its state when energy is supplied to it: solids become liquid, and a liquid become gaseous. If even more energy is supplied to a gas, it is ionized and goes into the energy-rich plasma state i.e the fourth state of matter.

Application of Plasma Technology in Textile Processing:

Due to high restriction in the control of chemical processing of textile materials, the new and innovative textile treatments are demanded.

In this regard, plasma technology shows distinct merits due to its environmental friendly and better treatment results.

Various eras where this technology can be explored includes pretreatments and other wet processes of textiles. Plasma can modify the surface properties of textile materials.

Plasma in Desizing:

It is very important that sizes should be removed by desizing to the dyeing and finishing of the woven fabrics. Plasma technology can be used to remove PVA sizing material from cotton fibers.

In conventional desizing process utilizes chemicals and hot water to remove size but plasma technology involves use of either O2/He plasma or Air/He plasma.

Firstly the treatment breaks down the chains of PVA making them smaller and more soluble.

X-ray photoelectron microscopy results reveal that plasma treatment introduces oxygen and nitrogen groups on the surface of PVA which owing to greater polarity increase the solubility of PVA .

Plasma in Dyeability of Synthetic Fibres:

In the synthetic fibres, plasma causes etching of the fiber and the introduction of polar groups leading to improvement in dyeability.

Plasma-induced surface modification of microdenier polyester produces cationic dyeable polyester fiber.

This believe that this technique can lead to a continuous flow system, low energy consumption, and more environmentally Friendly consumption, low temperature dyeing technology on Polyester Substrate.

Polyamide (nylon6) fabrics have been treated with tetrafluoromethane low temperature plasma and then dyed with Commercially available Dye Results showed that the plasma treatment slows down the rate of exhaustion but does not reduce the

Amount of Absorption of acid dyes .The dyeing properties of disperse dyes on plasma treated nylon fabric charged markedly when compared with untreated. A slight improvement in colorfastness was seen.

Advantages of the plasma technology:

1. It will be applicable to most of the textiles for surface treatment.
2. We can avoid the most of the effluent chemicals during process.
3. We produce the noval textiles to statisify the customer requirement.

What is Solvent Dyeing?

Solvent Dyeing is a new trend and most of the Modern Textile Mills are eagerly implementing this dyeing method to dye the Textiles.

Solvent dyeing is a dyeing process carried out from a continuous non-aqueous phase. Here solvent is used as dyeing media. But water may be added to assist dyeing process.

Characteristics of Solvents:

The solvent used for Textile processing should have the following characteristics

1. Non-flammable.
2. Non-corrosive.
3. Inert to textile materials.
4. Stable to repeated distillation.
5. Low Specific heat.
6. Low heat of evaporation.
7. Readily available.
8. Economic feasibility.

Types of Solvent Used in Textile Processing:

1. Tri-chloro Ethylen (TCE).
2. Per-chloro Ethylen (PCE).
3. Methyl Chloroform (MC)

Advantages of Solvent Dyeing:

1. Solvent is being recycled, so the effluent control problem is eliminated.
2. Rapid dyeing with minimum energy requirements.
3. Better levelness and dye yield compared with better fabric aesthetics.

Disadvantages of solvent dyeing:

1. Solvents are expensive, so higher production cost
2. Problem in equipment's availability.
3. Existing dye cannot be used in full range.

"Happy Week ahead

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