

Raw cotton vat dyeing using Corona plasmatic radiation as pre-treatment

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Abstract

Corona treatment consists on the application of an electrical discharge of high voltage (around 10.000V) through air between two electrodes, using frequencies around 40kHz, at normal atmospheric temperature and pressure, on dry cotton fabric, that can be applied in textile processing allowing to rationalize water, energy and chemicals that are spent in huge amounts within this industry, fulfilling the requisites of the new world ecological demands imposed by environmental concerns.

When Corona plasmatic radiation is applied as a pre-treatment of raw cotton fabric to be dyed with vat dyes, the process becomes shorter than the conventional one, lowering the costs and execution time, reflecting an economical and ecological impact on the textile process. This treatment is responsible by a complete hydrophilization of raw cotton by means of the oxidation of the hydrophobic layer, making cotton materials ready to dye directly skipping the stages of the preparation.

The global differences between conventional vat dyeing process and the process with Corona are evaluated. The final treatment of vat dyeing, in which Corona is previously applied, will include an oxidation process to promote simultaneously insolubilization and cleaning of the fabric.

The properties of the vat dyeing products in Corona process are maintained regarding the excellence on fastness to washing and rubbing, improving the uniformity in the final article with higher purity and more intensity and more intensity in darker colours.