

THE PRELIMINARY DISCUSSION OF SUPERCRITICAL CO₂ SPRAYING DYEING

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ABSTRACT

In this paper, a new concept of supercritical CO₂ spraying dyeing is discussed which the supercritical CO₂ spraying technology is referred. The supercritical CO₂ spraying dyeing gives up the original high pressure dyeing equipment which must be a good sealing, quick opening, and convenient reversing high pressure one. The new method theoretically realizes continuous supercritical CO₂ dyeing. The designed spraying dyeing machine adopts the smooth type dynamic labyrinth in the process. Through numerical analyses and experimental researches of pressure sealing characteristics of the spraying dyeing machine, it proofed that the smooth type dynamic labyrinth can meet the requirements of supercritical CO₂ dye. Furthermore, the experiment of the supercritical CO₂ spraying dyeing polyester fibers with disperse dye shows that it can achieve the same effect compared to the traditional supercritical CO₂ dyeing under the right conditions. The experimental research can provide guidance for the industrial production of supercritical fluid spray dyeing, and provide guidance for supercritical fluid spraying dyeing equipment manufacturing and pilot amplification at the same time.