



Topic: Ultrasonic assisted Textile Processing.

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Content:

What is Ultrasound Energy?

Ultrasound energy is sound waves with frequencies above 20,000 oscillations per second, which is above the upper limit of human hearing.

The normal range of human hearing is in between 16 Hz and 16 kHz. Ultrasonic frequencies lie between 20 kHz and 500 MHz.

How Ultrasound Help for Textile Processing?

Ultrasound reduces processing time and energy consumption, maintains or improves product quality, and reduces the use of auxiliary chemicals.

In essence, the use of ultrasound for dyeing will use electricity to replace expensive thermal energy and chemicals.

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In liquid, these high-frequency waves cause the formation of microscopic bubbles, or cavitation's. They also cause insignificant heating of the liquid.

Ultrasound causes cavitation bubbles to form in liquid. When the bubbles collapse, they generate tiny but powerful shock waves. We need to agitate the border layer of liquid to get the liquor through the barrier more quickly,



Mechanisms of Ultrasound Energy on textiles:

Increasing swelling of fiber in water.

Reducing glass transition (T_g) temperature of the fiber.

Reduce the size of the dye particles. It helps to enhance the transport of the dye to the fiber.

Application area of Ultrasound energy on textile Processing:

Ultrasonic desizing could lead to considerably energy saving as compared to conventional starch desizing.

The scouring of wool in neutral and very light alkaline bath reduces the fiber damage and enhance rate of processing.

It is more beneficial to the application of water insoluble dyes to the hydrophobic fibers.

Among the textile fibers, polyester is structurally compact fiber with a high level of crystallinity and without recognized dye sites.

Ultrasonic waves accelerate the rate of diffusion of the disperse dye inside the polyester fiber.

Benefits of Ultrasound Energy:

Energy savings by dyeing at lower temperatures and reduced processing times.

Environmental improvements by reduced consumption of auxiliary chemicals.

“Happy Week ahead”