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AirDye: Dyeing Fabric Without Water



It's changing the basics, the nuts-and-bolts of our lives, that can make the biggest difference. Adding color to the clothes we wear requires many times their weight in water – as much as 600 times as much water per ounce of fabric.

[Colorep, Inc.](#), a California sustainable technology company, has patented a process known as [AirDye](#), which dyes fabric without the use of water. The technology is about 6 years old, and the company is gradually licensing it to manufacturers of everything from [swimsuits](#) to [drapes](#).

Depending on the fabric, and type of dyeing, AirDye uses up to 95% less water, and up to 86% less energy, contributing 84% less to global warming, according to an independent assessment requested by the company.

Price Competitive Compared to Tradition Technology

Paul Raybin, VP of Sustainable Strategy at Colorep, said that while the AirDye process is comparable price-wise to vat (water) dyeing, companies using the technology are finding they are saving money by reducing waste. For instance, about 10% of vat-dyed fabric is damaged during the process, whereas in AirDye, only 1% is damaged.

Also, because AirDye is more flexible than vat dyeing, companies can wait longer to decide what color or print they want to put onto their fabric. This is especially economical for apparel makers who have to guess what colors consumers will want to wear months ahead.

“Manufacturers don’t have to speculate on what sells, they don’t have to guess whether orange will sell more in 18 months versus purple,” said Raybin. “It changes things.”

And as another plus, AirDyed fabrics do not leach colors or fade as easily as vat dyed fabrics, because the dye is actually inside the fibers.

How it works (But not on Cotton)

AirDye technology heats up fabric, then injects dye directly into the fibers in the form of a gas. Here's a demonstration video:

Because of the physics used in the technology, **it only works on synthetics**. This is a large caveat, since cotton and other natural fibers constitute about half of the worldwide market.

Still, as Raybin points out, AirDye could prove a major environmental boon. Every year, dyeing synthetic fabric consumes 2.4 trillion gallons of water, with untold environmental effects.

"Most vat dyeing has been moved off-shore because of costs and environmental reason," said Raybin. "The places where it's moved to, they're starting to wake up to the fact that they can't poison their own environment."

Now many of those countries are waking up to the environmental damage caused by dyes; AirDye could be a way for companies to meet new environmental standards while controlling costs.

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