

# Technical Tuesday

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## Waterless dyeing in Textiles...Possible

### WATERLESS DYEING...NEW ERA

The process of dyeing of textiles without water, Instead a medium which acts as a solvent like water, none other than Carbon di oxide in its super critical state.

#### NEED OF WATER LESS DYEING IN TEXTILE INDUSTRIES:

- The textile industry is believed to be one of the biggest consumers of water in terms of intake of fresh water and disposal of wastewater.
- On average, an estimated 100-150 liters of water is needed to process 1 kg of textile material, with some 28 billion kilos of textiles being dyed annually.
- Water is used as a solvent in many pretreatment and finishing processes, such as washing, scouring, bleaching and dyeing.
- Hence, the elimination of process-water and chemicals would be a real breakthrough for the textile dyeing industry, and it seems this has now come to fruition, with the launch of the world's first ever industrial dyeing machines that uses super carbon dioxide (CO<sub>2</sub>) as a replacement for water.

#### ADVANTAGE OF WATER LESS DYEING OVER CONVENTIONAL DYEING:

- Reduction of the effluent load due to disposal of water in conventional dyeing
- increase in the production of dyeing because the water less dyeing does not require sepearate drying because co<sub>2</sub> is a gas.
- Co<sub>2</sub> can be recovered and easily recycled.
- The efficiency of the water less dyeing is good compared to conventional dyeing process

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## DYEING PROCESS WITH CARBONDIOXIDE (CO<sub>2</sub>) (WATER LESS DYEING):

- When carbon dioxide is heated to above 31 °C and pressurised to above 74 bar, it becomes supercritical, a state of matter that can be seen as an expanded liquid, or a heavily compressed gas.
- In short, above the critical point,
  - a. carbon dioxide has properties of both a liquid and a gas.
  - b. In this way supercritical CO<sub>2</sub>, has liquid-like densities, which is advantageous for dissolving hydrophobic dyes, and gas-like low viscosities and diffusion properties, which can lead to shorter dyeing times compared to water.
- Dyeing is not required because at the end of the process CO<sub>2</sub> is released in the gaseous state. The CO<sub>2</sub> can be recycled easily, up to 90% after precipitation of the extracted matter in a separator.
- Worlds first commercially available dyeing machine launched by “DyeCoo Textile Systems B.V. is a spin-off of the Dutch Feyecon Group, an innovator in the field of CO<sub>2</sub> process technology.”
- commercial dyeing machines for dyeing synthetics is available from Dyecoo systems which also has entered into strategic partnership with NIKE to create sustainable apparels for eco-conscious people...

**Source:** <http://www.innovationintextiles.com/nike-adopts-waterless-dyeing-technology/>

“HAVE A HAPPY WEAK END A HEAD”

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