

US manufacturer opts for wastewater oxidation

By **Charlotte Rogers**

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US T-shirt manufacturer The Mountain Corporation has purchased an oxidation system for the removal the dye from its wastewater, in an investment expected to save the company up to \$1,000 a day and allow major expansion at its site in Keene, New Hampshire.

The system, which went live on January 3, was supplied by Indiana based O3 Solutions Inc, a specialist in environmentally friendly wastewater treatment.

The treatment system has a capital cost of around \$500,000 but will eliminate the \$500 daily expense of treatment chemicals previously used by the company to remove the colour of residual reactive dyes present in its wastewater. It also eliminates regulatory constraints and so will allow The Mountain to start a second shift, with increased production that effectively doubles its chemical saving to \$1,000 a day.

O3 solutions believes this to be among the first examples in the USA of ozone technology being installed at a mill, rather than as part of the wider public infrastructure.

Oxidation is a process by which the reactive dye molecule is broken down into chemical components, removing the colour completely. The process uses ozone, described by Kevin Clute, president of O3 solutions, as the most powerful oxidiser commercially available. Ozone contains three oxygen atoms, meaning it is heavier and more water soluble than oxygen.

To produce ozone on site, compressed dried air is run through a generator, which captures and discharges the nitrogen present, to provide a higher concentration of oxygen, which is needed to produce ozone. An electrical field converts normal oxygen into ozone, which is then drawn off to mix with the water.

Before adopting the ozone technology, The Mountain treated its wastewater with a combination of sodium hydroxide, sodium borohydride, sodium metabisulfite and acetic acid. This aqueous solution was used to lower the pH to 5.5, thereby de-colourising the water.

However, once downstream the pH of the water rose when it came into contact with a larger flow of municipal wastewater, diluting the stabilisers and causing the pH to rise. Consequently the colour of the reactive dye returned. As colour is used as a quality control parameter, an excess of dye resulted in regulatory problems.

The Mountain was given a daily allocation of 21,000 gallons of chemically charged wastewater discharge, which meant the company could not process its garments as quickly as it would wish to or expand its plant, said Mr Clute.

As well as saving the company the reoccurring expense of complex wastewater treatment, the ozone treatment is said to remove issues relating to extremes of pH and concentrated acids, which can impact on worker safety.