

European Consortium to Demonstrate EColoRO Concept for Wastewater Reuse in the Textile Industry

New technology slashes both water consumption and costs using environmentally responsible techniques

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Textile mills can reduce their water consumption by up to 90 percent using the EColoRO technique, which consists of electrocoagulation followed by membrane filtration, to treat their wastewater and then reuse it. On June 1, 2015 a European consortium led by the Dutch company EColoRO BV in Almere and the Institute for Sustainable Process Technology (ISPT) in Amersfoort, the Netherlands will commence a 3.5-year project to demonstrate the new technology on site at full industrial scale, first at a textile mill in Belgium and later at a textile mill in Italy.

The project, which is part of Europe's Horizon 2020 research program, has a budget of €4.8 million, of which €3.7 million will be provided by the European Union. The remaining consortium members are a Belgian textile mill, Belgium's VITO institute for technology research, Czech company INOTEX Ltd, Dutch company Morselt Borne BV, and EURATEX – the European Apparel and Textile Confederation. EColoRO will provide operational management and ISPT is responsible for overall project coordination.

Textile dyeing and finishing processes traditionally consumes significant amounts of water. Fabric is usually run through a dye bath to color it, followed by several rounds of rinsing to remove any dye that has not bonded with the fabric. In the most favorable situation, the rinse water, which contains reactive pigments and toxic chemicals, is routed to a public or private treatment plant. Once there, the dyes and other chemicals are often not fully removed from the water, however, which limits its reuse potential and creates a burden on the environment. The EColoRO technique will make this problem a thing of the past.

The core of the EColoRO technique is electrocoagulation, which enables the removal of 93 to 96 percent of the dyes and pigments in textile wastewater. Membranes can then be used to fully purify the water via ultrafiltration or reverse osmosis. As a result, up to 90 percent of the water can be reused. About 10 percent will be lost due to concentrated waste stream or escapes via evaporation.

The new technology has two major advantages: it enables textile mills to reduce fresh water consumption by up to 90 percent, and it lowers their wastewater treatment costs. Other advantages include relatively low energy consumption, no additional chemicals, and no required changes to existing processes. EColoRO's innovative approach integrates electrocoagulation with systems that are already being used in industrial applications, accelerating the step to commercial market implementation when the project completes.

In addition to demonstrating the EColoRO concept, within the consortium INOTEX will investigate how textile mills can make optimal use of the treated water and VITO will look at ways to reuse the pigment- and iron-rich slurry generated by the purification process.

"This is an example of an environmental solution with a huge impact that generates money rather than costing money," says Eric van Sonsbeek, EColoRO's director and cofounder. He estimates that European textile mills will earn back their investment in two to four years.

"The EColoRO concept is an excellent alternative to existing energy-intensive wastewater treatment techniques," says Tjeerd Jongsma, ISPT's director. "The new technology is also a godsend for textile mills in water-deficient areas in Europe and other places where the provision of drinking water is a growing problem. It also aligns with the industry's desire to increase the use of energy from renewable resources, in this case the use of renewable electricity to treat and reuse large quantities of process wastewater."

About EColoRO

EColoRO Water Treatment Solutions works with customers around the world to design and implement innovative water purification solutions. The company's main focus is on reusing wastewater streams in order to decrease operational costs and reduce environmental pollution.

About ISPT

The Institute for Sustainable Process Technology is a collaboration between industry, universities, and knowledge institutes that works to accelerate innovation processes and make them more efficient than they are at present. In addition to fostering the generation and exchange of knowledge, the institute aids the development, demonstration and application of breakthrough technology with a special focus on process technology.