Water system provides cost savings for paint manufacturer, UK

Automotive | Case Study

The Client

Pro-Spray Automotive Finishes Ltd is making a major contribution to sustainability, environmental protection and health & safety by developing a water based automotive refinishing paint.

Pro-Spray® H2O Waterborne Basecoat is a premium automotive waterborne paint system designed for bodywork repair shops as a replacement for solvent based products. The product is formulated using advanced European technology to deliver quick coverage, precise colour match, superior metallic orientation, easy blending and fast dry times, and is part of a complete line of low VOC automotive surface preparation products.

In 2008, Pro-Spray moved to a new UK manufacturing facility in Biggleswade with 4900m2 of office, manufacturing and distribution capabilities.

Key Figures

- Water quality of 10µS/cm is key to the success of water based paint
- Bulk buying IBC's to meet production requirements
- Water quality specification could not be guaranteed, so a new solution was required

The Client's Needs

Every bit as important as the paint pigment is the quality of the water used as the base, and Pro-Spray require bacteria-free, deionised water of conductivity less than 10µS/cm.

In order to ensure water quality, Pro-Spray purchased de-ionised water in 1000 litre IBC containers at a cost of almost £300 per container. Due to the lead time from their supplier, they found it necessary to purchase IBCs in batches of six with the result that valuable storage space was occupied by deionised water.

In researching ways to ensure the consistency of their paint, Pro-Spray found that storing bulk quantities of demineralised water could result in contamination issues. Veolia Water Technologies proposed an on-site demineralisation plant to produce water of the specified quality as and when required, eliminating the need for storage and ensuring that this problem would never arise.

The Solution

Veolia Water Technologies's solution was for Pro-Spray to produce their deionised water on demand using a combination of reverse osmosis and ion exchange technologies.

This solution would not only be more cost effective than buying in bulk IBC's, but would ensure the quality of water could be guaranteed and product formulation could be repeated. It would also eliminate the need to order, handle and store IBC containers, improving health & safety on site, and saving the company time.

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Process Description

Mains water is delivered into a break tank and then pumped to a MiniRO™ reverse osmosis plant that removes 95% of dissolved solids and 99% of organic contaminants and bacteria.

The treated water (permeate) from the MiniRO™ is collected in a treated water tank from which it is pumped through a UV disinfection unit, a cartridge filter and a Service Deionisation (SDI) cylinder to produce deionised water of better than 0.5µS/cm conductivity. This is delivered to the points of use on the manufacturing line via a ring main.
When there is no demand for production, the deionised water is re-circulated around the ring main to the treated water tank and through the UV to maintain water quality.

The SDI cylinders are filled with mixed bed ion exchange resins which remove all the dissolved salts from the permeate. When the resin becomes exhausted, the SDI cylinder is returned to Veolia Water Technologies's regeneration station and replaced with a fresh one.

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Results

The Veolia Water Technologies system has a smaller footprint than that of storing IBCs and, because deionised water is produced on demand, there are no issues with deterioration of quality during storage. A conductivity meter on the SDI cylinder continuously monitors treated water quality and a UV intensity meter ensures efficient disinfection to provide continuous verification for quality control and audit purposes.

Whilst Pro-Spray's main objective was to ensure that their deionised water quality specification could be consistently met, they were pleased to find that the new plant is saving them approximately 25p per litre of water compared to the cost of buying IBCs and this will give a payback on the capital cost of the plant in less than two years.

Benefits

- On demand supply of deionised water
- Saves money – cost effective alternative to bulk buying water
- Quality Control improved
- Eliminates the need to order, manual handle or store IBC's

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