

SIEMENS

Ingenuity for life

True colors

Cost-efficient carpet dyeing with
Coriolis flow measurement

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At Lano Carpets in Belgium, the inline mixer can handle any color with the help of the SITRANS FC410 Coriolis flowmeter.

Automatic color switching made a reality

Lano Carpets in Harelbeke, Belgium, produces 20,000 m² of tufted carpet every day. To increase the flexibility of its machines and reduce costs, the company decided to stop manufacturing its dyes in batches and switch to a continuous process using an inline mixer that produces the right color instantly.

This innovative system, designed and created in conjunction with Solution Partner ProcAT, requires highly accurate process management to continuously produce a precise color shade every time. Using Siemens Coriolis flowmeters, the coloring agents required to manufacture a specific color shade are injected into the inline mixer in proportions that stringently adhere to the settings. However, it is when the machine changes from one product to the next that the new concept shows just how effective it is: switching to a new color is virtually automatic and involves minimal waste.



The SITRANS FC410 ensures that the coloring agents are correctly proportioned as they are injected into the inline mixer.

Business challenge

To avoid time loss and product waste associated with traditional batch manufacturing, Lano Carpets decided to switch to a continuous process based on an inline mixer that injects coloring agents into a collector containing a premix.

Technical challenges

Obtaining precise color shades and avoiding discrepancies requires a highly stable process and accurate dosage of the coloring agents, in the right proportions, taking account of the premix flow rate.

This control requires precision flow-rate measurement, both for the premix and for the coloring agents, as well as constant pressure inside the collector. The recipes are managed by a SCADA system that regulates the dosage of the coloring agents according to the desired color shade.

Conceptual solution

A large quantity of premix is prepared with all the ingredients of the dye apart from the coloring agents, which are processed in separate batches of

three colors: yellow, red and blue. Two different concentrations are created to obtain a wider range of colors in the dosage process.

These coloring agents circulate continuously around the machine and are injected into the collector through a valve. Frequency-controlled pumps ensure the correct proportions are used, while the Coriolis flowmeters transmit the required feedback to the pump control system. Turbulence inside the collector ensures good mixing so that the carpet dyeing remains homogeneous.

Product range

The volumes of coloring agents pumped into the machine are measured using SITRANS FC410 Coriolis flowmeters.

Control and supervision of the application is through a SIMATIC WinCC system, which translates the recipes sent by the ERP into precise dosages of coloring agents.

Technical benefits for the user

The Coriolis flowmeters provide maximum precision for the pump control system, which plays a pivotal role in the mixing ratio. The flowmeters measure the flow rate and density and convert them into a volumetric flow rate, i.e., the quantity that determines the mixing ratio.

The SIMATIC WinCC display allows operators to supervise the process and ensure its stability, so that every color shade can be accurately reproduced and the risk of error eliminated.



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