saint clair systems
TEMPERATURE & VISCOSITY CONTROL

Case Study

# Material Temperature Control Proves Effective for 100% Solids Coating Dispensing

**Summary:** Saint Clair Systems collaborated with a global manufacturer of wind turbine blades to overcome the combination of variations in temperature and a paint formulation they were not allowed to alter.

## Issue:

A wind turbine blade manufacturer had to idle their automated paint equipment due to fluctuations in temperature that caused variation in paint viscosity. Product standards prevented them from changing the paint formulation and they had to convert back to a manual spray application. This slowed their production time and added cost overruns due to both labor increases and material usage.

## Analysis:

The paint they were required to use was sensitive to normal changes in ambient temperatures and they were prohibited from making changes to the paint formulation. Temperature variations caused viscosity changes that created surface finish issues including paint build-up and voids. Inconsistency in manual spray applications was causing abnormal paint coverage and labor costs.

## Solution:

The company was uneasy about making another capital investment as they had recently abandoned their automation equipment. Understanding their reluctance, Saint Clair Systems agreed to supply them with a demonstration unit so they could confirm its effectiveness before making a commitment. The combination of our Temperature Control Unit and Flexible Tube-in-Tube Heat Exchanger allowed them to maintain their optimal dispense viscosity by providing a 77°F material temperature at the point of application.

*See page 2 for additional details.*

**Company**:
Wind Turbine Blade Manufacturer

**Location**:
United States

**Material Used**:
100% Solids Coating

**Summary**:
The company invested in automation of the coating process for its wind turbine blades.

The coating did not allow for adjustments with either solvent or water, leaving the automated coating process ineffective during shifts in temperature that affected material viscosity.

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**Results**:
Reimplementation of the automated spray equipment immediately reduced labor costs by 50%. Additionally, maintaining viscosity using point of application temperature control, generated an immediate 4% reduction in excess paint usage. Finally, eliminating surface defects helped the company support their 30-year warranty requirement and bring additional business to their North American plant.

## Equipment Used

### Standard Temperature Control Unit

Given the pressures, material flow rates, plant temperature and optimal material dispense temperature, it was determined that a Temperature Control Unit with a 3kW heater and ½-ton chilling capacity would be sufficient to maintain the optimal paint temperature to within +/- 1°F at the point of application.

### Recorable Coax Flexible Tube-in-Tube Heat Exchanger

- Converts your existing material path into a heat exchanger.
- Designed to be removed and reattached, allowing the material tube to be changed as required for easy system maintenance.
- Ideal for painting and for controlled motion applications.
- Non-conductive version available for electrostatic applications.