TECO Technical Solution #4

"Active Velocity Compensation" Maintains Accuracy over a Wide Range of Consistency Applications

Problem / Issue:

The Addition of Dilution Water for Consistency Control makes the Sensor "Appear" to ***Increase the Consistency***, due to Velocity (flow) Forces Exerted on the Strain Force Consistency Element.

TECO Solution:

TMC-6000 Microprocessor Consistency Transmitter.

Overview:

A common problem for standard strain gauge consistency elements is that they "see" the effects of increased velocity (or flow) and to display them as increased consistency levels. This is commonly seen during the addition of dilution water for consistency control, attempting to lower the consistency.

In this application the standard consistency measurement element is affected by the total amount of force placed on the wetted portion of the sensor. This total force acting on the probe is the sum of the shear force that can be correlated to consistency and the force due to the flow (or velocity) of the water in the stock.

The shear force is the amount of force it takes for fibers to shear (un-tangle, or unbond in a slurry) across the surface area of the consistency element. The shear force is constant, regardless of the velocity, only changing with fiber concentration or fiber characteristics.

The force related to the flow velocity is different from the shear foracr and has a significant impact on the total force acting on the consistency probe. As the velocity increases, the flow-related force is proportional to the square of the velocity of the stock, consequently increasing its impact on the total force measurement.

How the TECO Solution Solves The Problem…

The TECO TMC-6000 Microprocessor Consistency Transmitter incorporates the flow measurement signal to actively compensate for the changes in velocity.

This allows the TECO consistency elements to maintain their high level of accuracy over a wide range of production changes and throughput levels.

Benefits

Optimal Consistency Control – eliminates flow related errors and limitations
Greater Range of Production Rates – accurate over a greater range of production rates
Improved Process Performance – Control results from accurate measurement
Ease of Maintenance – no calibrations required for different tonnage rates

Who is it Important to ?

Process Control Engineer
Maintenance Manager
Instrument Engineer
Production Manager

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