

Application note

Measuring moisture in injection molding process

Summary

Moisture is measured in the air used to dry a hopper of plastic resin pellets in injection molding and extrusion processes. The presence of excess moisture in the air used to dry plastic pellets has several adverse effects upon the plastic products that are produced. Excess moisture causes clear plastic products to have a cloudy appearance, decreases the strength of the product and a poor finish on the surface of the product. These defects reduce process yield while increasing production costs.

Application

The air used to dry plastic pellets is contained in a closed loop consisting of a dual-bed regenerative desiccant-type dryer and a hopper containing the plastic resin. The dryer produces hot dry air that is blown through a duct to the hopper. The hot dry air removes moisture from the plastic resin in the hopper and circulates it back to the dryer. In the dryer, the air is cooled, the moisture is absorbed by the desiccant, and then the air is reheated. The moisture analyzer sample system is typically installed at the inlet to the hopper. The sample system cools and filters a sample of the air as it flows to the moisture sensor, and then vents it out to the atmosphere.

Challenge

In the past, the desiccant dryer beds were switched with solenoid valves controlled by a timer. Switching the beds in this manner can cause one of two things: Allow wet air flow to flow to the hopper should the bed become saturated before the timer setpoint is reached or allow the beds to be switched before necessary, thus causing them to be regenerated prematurely. Both can reduce process efficiency and increase costs.

Benefits:

With a Panametrics analyzer permanently installed at the hopper inlet, any failure of the dryer is immediately detected. If the air at the hopper inlet is not sufficiently dry, the analyzer alarm contacts can be set up to switch the dryer beds and prevent wet air from entering the hopper. This configuration of the Panametrics analyzer optimizes the drying process and minimizes drying time by feeding only dry air to the hopper inlet.



The solution

The Panametrics dew.IQ single channel analyzer offers the perfect solution for a single molding machine. If there are several molding machines a multichannel analyzer like the moisture.IQ offers a great alternative as up to six measurements can be carried out on a single analyzer platform. For customers that prefer transmitter type solutions, the HygroPro is a great fit. Panametrics also has OEM solutions for Injection Molding Machine builders, consult your local Panametrics representative for more details.

Application specifications

-50 °C to -10 °C (-58 °F to 14 °F)

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