

Application Note

Measurement of Tubing Degradation

In recent years it has become common practice in process development suites at most any pharmaceutical or biotech company to have a sensor measuring pH, a sensor measuring dissolved oxygen, perhaps one for CO₂ and often, at least a couple of these are redundant. Their purpose is to provide real time insight into the environment within the bioreactors and/or fermentors. However, if you want to change that environment, perhaps pump in some acid, base, or a bit of glucose, what sensor have you had to ensure that the pumps are performing at least as well as the in situ sensors? None. Instead of measuring pump performance and thereby tubing degradation, it is common practice to depend upon a collection of "Tubing Life Charts" and active observation.

NON-INVASIVE FLOW SOLUTION

Today, with the introduction of the Non-Invasive Flow Measurement Solution from Transonic Systems, you have the tool needed to toss out tubing life charts and re-task your time previously allocated to tubing observation. All the while you are improving process accuracy, achieving real time continuous monitoring of tubing performance and thus greatly reducing if not eliminating instances of catastrophic tubing failure.

FLOW LOOP (FIG. 1)

The Non-Invasive Flow Measurement solution from Transonic Systems is a measurement loop that provides high accuracy volume flow measurements. It consists of two innovative components

FLOWSENSOR

The first is a Transit-time Ultrasound Flow Sensor. This sensor simply clamps around your existing process tubing, thus making no contact with your process media and creating no pressure drop. The measurement principle utilized by this sensor is well proven; as the media passes through the tubing, the sensor directs ultrasound signals through the tubing which measure media flow both upstream and downstream.

FLOW MODULE

The resulting value is then indicated at the second component of this measurement loop, the Flowmeter, as Flow Volume. The Flowmeter displays the real time flow measurement on an integral LED display or transmits the measured flow value as an analog output to a bioprocess control system for utilization in continuous monitoring of tubing performance and indication of tubing degradation with unequalled volume flow signal resolution.

As the bioprocess industry continues to move toward increasingly disposable process models with increased amounts of traditional tubing, monitoring tubing degradation allows a bioprocess operator to define allowable limits of tubing performance in their SOPs, and thus reduce the risk of catastrophic tubing failure.

To learn more about the Non-Invasive Flow Measurement solution from Transonic Systems give us a call at (800) 353-3569 or visit us on the web at www.transonic.com/bioprocess.

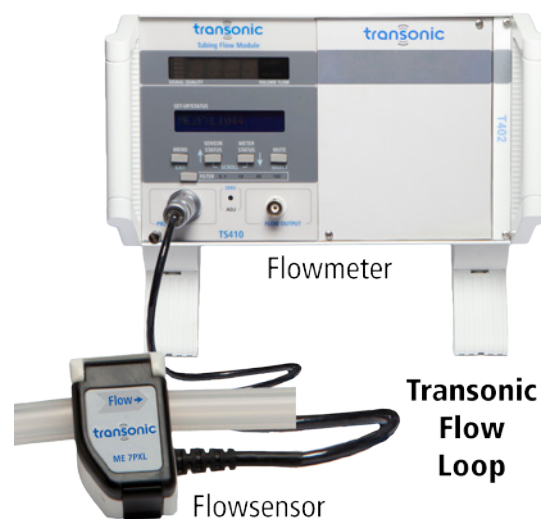


Fig. 1: Transonic Flow Loop consisting of non-invasive clamp-on Tubing Flow Sensor and Flowmeter.