

# Three pH measuring loops guarantee long term accuracy and reliability

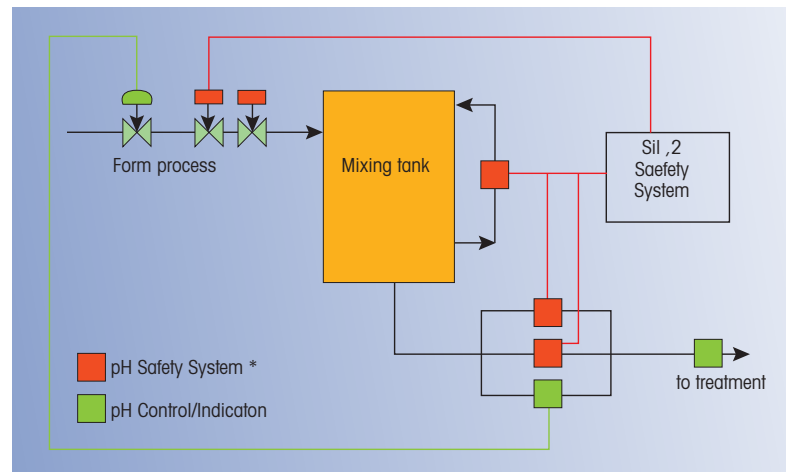
**High pH-stability in the vessel guarantees keeping waste limits within the required specifications. A system of three pH measuring loops brought Degussa Fine Chemicals very satisfying results.**

**Degussa Fine Organics at Seal Sands, England**

Degussa Fine Organics are is of Degussa's Fine and Industrial Chemicals Division. Degussa produces highly profitable specialty chemicals and is market leader in this field. They maintain over 300 plants world wide, employing 45'000 people generating over EU 11 billion sales in 2004.

**Degussa's demand for determined pH limits of waste**

Degussa Fine Organics at Seal Sands in the North East of England have installed METTLER TOLEDO in-line pH measurement systems with automated cleaning to ensure that waste passed off site is within the pre determined limits set by a third party treatment company.



\*InPro 2000, InTrac 776, pH 2100 e, EasyClean 200



**Changing conditions require detailed clarification**

pH was defined as one of the most important analytical parameters to ensure that the waste would be within the required specification and would not cause any degradation of the treatment company's pipe transporting it to the treatment plant some distance away. The waste, which comes from many different processes, is collected in a storage vessel where it is blended together before leaving site. In order to fully understand and control this waste collection procedure it is important to know the pH value of the liquid in the tank (this may change greatly over time depending upon which process it comes from), the pH value of the mixed waste as well as that of the waste as it leaves site.

**Correctly placed measuring loops for optimal surveillance**

It was decided that due to the fact that the greatest variability in pH would be seen at the outlet from the tank. The 3 loops would be installed on a redundancy safety voting system to ensure accuracy of measurement. Two of the safety loops were installed on the outlet and one on the recirculation leg of the vessel to measure the homogenized liquid. A normal control loop was installed alongside the 2 safety loops on the tank outlet and the fifth in the pipe which leaves site to give the final measurement. If the control pH deviates from set parameters there are valves on the outlet which switch from offsite transfer to tank re-circulation until the desired pH is achieved. If the pH value falls even lower than the control setting then the Safety System will close the inlet to the tank.

**High accuracy and reliability determine product selection**

InPro 2000 electrodes were chosen as they could offer the most accuracy and reliability in the changing composition of the waste and were installed in InTrac 776 housings.

As it was known that the liquid would foul the glass membranes of the electrodes, an EasyClean 200 was installed at each measuring point to automatically withdraw the electrodes, flush them with water and clean them with hydrochloric acid before washing the acid away with water and re-inserting the electrode.

The pH 2100 e transmitters are programmed to stagger the cleaning cycles so that only one electrode is removed from the process at a time. During the cleaning process the output from the transmitter is held at the last measured value.

**Fixation of a constant pH-value**

Once long term accuracy and reliability had been ensured the re-circulation pH measurement could be used to control pH correction in the storage vessel.

**Further problems to be solved**

Since solving this difficult measurement Degussa Fine Organics have come to rely on METTLER TOLEDO for many of its in-line and R&D analytic measurements including pH, conductivity, O<sub>2</sub> concentration in inert environments and turbidity in crystallization.

### **METTLER TOLEDO solution**

The following products were installed to meet the customer's requirements:

#### **InPro 2000**

##### **liquid electrolyte pH-electrode:**

- Used as problem solver in a wide range of applications
- Automatic temperature compensation during calibration and operation
- Excellent response time and accuracy
- No fouling of diaphragm in sulfide bearing media due to silver-ion trap

#### **EasyClean 200**

- Automatic sensor flushing with water
- Additional cleaning with cleaning solution
- Free choice of cleaning agent
- Especially designed for heavily contaminated processes

#### **InTrac 776 retractable housing**

- With built-in flushing chamber
- Electrodes can be cleaned and recalibrated without interruption of the ongoing process
- Designed for chemical applications
- Manual or pneumatic versions

#### **pH 2100 transmitter**

- Reliable and safe transmitter in operation
- Self-explanatory user interface
- Several possibilities of diagnosis

#### **The customer's benefits**

- Highest measuring accuracy and reliability with InPro 2000 pH electrode
- Automatically and individual cleaning at each measuring point of electrode with EasyClean 200
- Staggered cleaning cycles with pH 2100 e transmitters

