

# METTLER TOLEDO APPLICATION NOTE

---

## pH Measurement In Wastewater Of Dehairing And Tanning Processes

### BACKGROUND

#### *Dehairing and tanning of sheep skin*

One of the first steps in leather manufacturing involves the separation of the hair or wool from the skin. Sheep skins received from slaughter houses go through a wet and warm dehairing process, which may involve sodium sulfide. This step is followed by degreasing and tanning.

### THE PROCESS

#### *Wastewater from dehairing*

The various waste waters produced by the dehairing process are collected in an open buffering vat for homogenization. They are then subjected to a coagulation and flocculation process to separate the solids from the liquid phase. The sludge is later recovered, concentrated by filtration, and used as compost. If the dehairing process involves sodium sulfide, then the wastewater is desulfurized before it enters the buffering vat.

pH is measured in an open vat to control the coagulation process. Typical process conditions are as follows:

pH range: 3 - 4  
pressure: ambient  
temperature: ambient  
measuring solution: contains fat, mineral salts, soil and suspended materials

After separation of the sludge, the wastewater is adjusted to pH 7 by carbonation before it enters the sewer.

#### *Wastewater from tanning*

Waste waters from degreasing and from chrome tanning or vegetable tanning processes have to be treated before they enter the sewer. Salts are precipitated and the sludge is removed and de-watered in a filter press. Sulfides are removed with hydrogen peroxide. The wastewater is then adjusted to a pH 9.0 +/- 0.5 with lime in an open, stirred vat before it is released into the sewer.

pH is measured in the open vat under the following conditions:

pH range: acidic to 9  
pressure: ambient  
temperature: ambient  
measuring solution: contains solvents, organic matter, suspended materials and possibly traces of sulfides

### INSTRUMENTATION

Suspended material, organic substances, and fat in the measuring solution are likely to cause contamination of the reference junction and drifting pH signals with any electrode containing a diaphragm junction. We therefore recommend the use of METTLER TOLEDO's Xerolyt® pH electrode with solid reference electrolyte and dual open junctions. The pH range of the process, the absence of large temperature fluctuations, and the requirement for as little maintenance as possible also make this electrode the best choice. Cleaning and calibration should be performed weekly.

This electrode should be used in conjunction with InDip® 500 immersion housing and a Model 2100 pH analyzer.

## PRODUCTS

### 2100 pH Analyzer

- Detachable front panel and plug-in terminals for ease of installation
- All functions accessible through the keypad for increased ease of use
- Continuous sensor and transmitter diagnostics to monitor performance
- FM certification for Class I, Div 1 & 2 Environments and CSA General Purpose Approval
- 3 year warranty

### Xerolyt<sup>®</sup> DXK pH Electrode

- Patented Xerolyt solid polymer reference system maintains a stable potential for accurate and repeatable pH measurement and low maintenance
- Open junction eliminates reference clogging and extends sensor life
- High pressure resistance eliminates requirement for pressurizable housing
- Xerolyt solid polymer is particularly suitable for use in emulsions, suspensions, heavily contaminated or sulfide-containing media, and solutions with high concentrations of suspended solids

### InDip<sup>®</sup> 500 Series Immersion Housings

- Economic method of sensor installation in open tanks and vessels
- Rugged protective cage protects the sensor against abrasive solids in the process medium