

# Oxygen Control in Gas Phase for Safely Recovering Flammable Solvents

**Fast response, high reliability and minimal down-time were paramount for measuring gas-phase oxygen in the headspace of metal barrel shredders and in a thermal recovery unit.**

## **A dynamic US company in the waste management industry**

Our customer is an innovative waste management company centrally located in Arkansas, USA. It manufactures fuel derived from waste oils and solvents that is used as a secondary fuel source to replace coal and natural gas in cement kilns.

## **Oxygen measurements in the gas phase**

The facility has two different applications of gas-phase oxygen measurement; in the headspace of metal barrel shredders and in a thermal recovery unit.

## **Oxygen measurement in the headspace of metal barrel shredders**

Most of the waste solvents arrives at the facility in metal 55 gallon drums. The bulk of the liquid is drained from the containers and collected. The drums are decontaminated from residual organics using further heat treatment which first requires the metal containers to be shredded into manageable pieces (see figure).



The shredders are hoppers which have a large rotating roller with steel “teeth” that chops the barrels into easy to handle pieces. Given the likelihood of sparking with the metal-to-metal contact, combined with the fact that flammable solvents may be present, it is important that the system be operated below critical oxygen levels. Without sufficient oxygen, fire or explosion is not possible even though fuel and an ignition source are present. This form of explosion prevention is called “inerting”.

### INGOLD solution with gas-phase oxygen system controls shredder

The drums are loaded through the top of the hopper, the top is then closed sealing, the system. Now carbon dioxide purge gas is applied. As the oxygen-rich air is replaced by the carbon dioxide, the oxygen concentration in the vessel is continuously monitored using a Mettler-Toledo Ingold gas-phase oxygen system. The shredder may only be activated once the oxygen level reads below 8% oxygen. Accurate readings of oxygen clearly play a critical role in the safe operation.

### InPro 6800 G meets tremendous challenge of process

While the safety aspect is paramount, system reliability and rapid speed of sensor response directly impacts process efficiency and throughput. Delays due to sensor response time, extend the batch operation cycle time, reducing process efficiency.

### The successful measuring system

The fast response of the InPro 6800 G eliminates this problem. The high reliability of the sensors also minimizes downtime resulting from sensors being out of service. Each of the six shredders is equipped with a METTLER TOLEDO Ingold InPro 6800 G gas-phase oxygen sensor and M420 transmitter. In addition, 3 additional sensors and transmitters are available as “hot back-ups” ready for immediate use, eliminating process downtime even during routine maintenance.

For more information:

[www.mt.com/o2-gas](http://www.mt.com/o2-gas)

