

Reduce Costs and Improve Reliability in Centrifuge Head Space Oxygen Monitoring

Monitoring gas phase oxygen in centrifuges is a critical measurement in the prevention of explosions and fires. A METTLER TOLEDO oxygen system provided our customer with an inexpensive, low-maintenance and dependable solution.

International company

This application focuses on a large multinational biopharmaceutical company specializing in the manufacture of active pharmaceutical ingredients (APIs), medical devices, nutritional products and laboratory diagnostics. Within these areas, animal health, diabetes care and vascular products are a few of their areas of expertise.

Gas phase oxygen in centrifuge monitoring

The customer operates multiple centrifuges in the manufacturing process to separate ingredients (solids) from base liquid for continued processing into finished goods, in this case APIs. This is a common practice and requires the use of gas phase oxygen monitoring in the head space of the centrifuge. The O₂ measurement is used to control the dosing of inertization gas (often nitrogen) to remove the risk of explosion (figure 1 illustrates the control method for this application). Excessive O₂ in the process also indicates potential degradation of the API's quality through oxidation. FM class 1 Div 1 instrumentation was a requirement in this environment given the explosive nature of the location.

The local METTLER TOLEDO sales representative noticed that the customer occasionally mentioned challenges with the existing oxygen monitoring system, including the need for time-consuming

and costly maintenance, as well as the complexity and cost of the existing system's sample conditioning requirements.

Expectations

To improve the cost-effectiveness of this installation, the customer was eager to remove the existing system and replace it with one with a proven track record of performance from a well-known manufacturer of industrial instrumentation, to take advantage of superior customer support options. The customer had projects scheduled in the near future requiring the same monitoring system and viewed this as an opportunity to evaluate a better solution to use going forward.

Existing system

The existing system cost an estimated \$100,000. Not only was the system very

costly, it was not designed with GPO measurement for inertization of centrifuge head space in mind. This led to additional challenges with sample conditioning, operation, maintenance and control.

METTLER TOLEDO solution

The most effective METTLER TOLEDO solution for the customer's requirements was the use of the InPro 6800 series sensor with gas phase membrane, coupled with FM Class 1 Div 1 transmitter 4100e. This solution offered the level of control the customer required using the analog outputs from the 4100e. The large LCD pictographic display and IP 65 rated enclosure made it an easy instrument to read, as well as install.

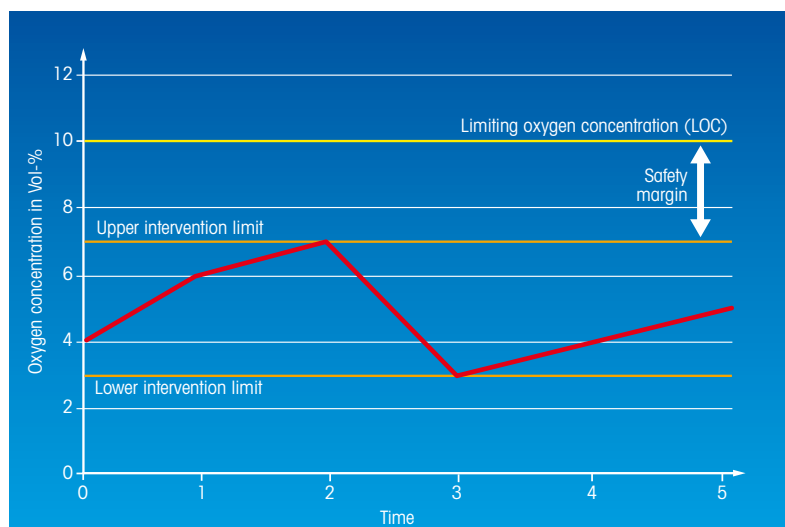


Fig. 1: Oxygen measurement and control method



InPro 6850 i

The InPro 6800 offered many benefits over the existing sensor solution. Its modular construction with easily replaceable membrane cartridge, affords simple and convenient servicing requiring no special tools. Additionally, the customer's on-site technicians could replace the quick-disconnect inner body, reducing shipping costs and process downtime. Of concern in this application was the need for sample conditioning for the existing instrument, something unnecessary with the InPro 6800 sensor.

The customer installed the recommended METTLER TOLEDO measurement system in to the exhaust stream of a centrifuge.

Updates to the METTLER TOLEDO product portfolio

At the time of this customer's application the appropriate transmitter was the 4100 e, a robust and proven product. As an innovative company in the industrial instrumentation space, METTLER TOLEDO seeks to improve products and services to provide better value to our customers and partners. It is with that in mind that we have superseded the 4100 e transmitter with the new M420 transmitter.

The M420 continues METTLER TOLEDO's leadership in sensor asset management by integrating Intelligent Sensor Management

(ISM) technology into a two-wire, loop-powered transmitter designed for hazardous environments. The M420's design and intuitive user interface easily mesh with any customer installation. The M420 comes in models for pH and DO, each offering mixed-mode inputs for installing traditional analog sensors or digital sensors with ISM, such as the InPro 6850 i for biotechnology applications. Options also include one or two analog outputs and the selection of FM Class 1 Div 2 or FM Class 1 Div 1 certification.

ISM technology provides the instant recognition of a sensor's serial number, part number and calibration information when plugged into the transmitter. In addition, the M420 with ISM offers a Dynamic Lifetime Indicator and Adaptive Calibration Timer for both pH and DO. These sensor management functions incorporate dynamic and static measurement values from pH and DO sensor installation conditions. This allows you to proactively predict the need for pH electrode calibration or replacement and DO sensor membrane and/or inner body replacement. Combined with METTLER TOLEDO's iSense Asset Suite software for your laptop or desktop computer, ISM offers a true sensor asset management solution.

Customer satisfaction through cost savings

The evaluation of the METTLER TOLEDO solution over the trial period went very well, with the customer extremely satisfied with the performance and cost effectiveness of the system. This led to the ordering and installation of two additional systems and plans for utilizing the same system solution in future projects.

The customer's maintenance interval for the InPro 6800 sensors runs on the order of three months, with consistent measurements in between membrane replacements. Total replacement parts cost over the past two years that the systems have operated has been only \$3900, a significant improvement over their previous solution.

If you wish to reduce your costs and improve the reliability of gas phase oxygen measurement, visit:

▶ www.mt.com/o2-gas

▶ www.mt.com/ISM

