AMETEK®
TEST & CALIBRATION INSTRUMENTS

A TIME-SAVING, HIGH-ACCURACY HUMIDITY CALIBRATION PROCESS

By pre-calibrating temperature sensors in the laboratory, our pharmaceutical customer has saved time, increased accuracy, and is able to minimize their downtime.

- Henrik Bendsen, product manager at AMETEK Test & Calibration Instruments

THE APPLICATION

Humidity measurement is an important parameter in many industrial processes, but measuring it correctly can be tricky. Relative humidity is a term used to describe amount of water vapor present in air expressed as a percentage of the amount needed for saturation at the same temperature. It is crucial that temperature is precisely determined to get an accurate relative humidity measurement. If the room temperature measured is off by only 1°C, the humidity measurement can vary by up to 3-4%.

In order to ensure accuracy, an international pharmaceutical company, has chosen to use AMETEK's JOFRA RTC Reference Temperature Calibrators as an integral part of their process for calibrating their humidity measurement instruments.

THE CHALLENGE

On one hand, regulations are getting tougher regarding proper testing and calibration of processing equipment by means of programs like GMP and ISO, yet on the other hand companies are under internal pressure to lower costs. Today, many companies are implementing LEAN projects to help them increase accuracy, reduce calibration time, speed up operational downtime response and avoid improper deviations.

Humidity calibration, necessary for example for monitoring the packing facilities and climatic test chambers, has traditionally been done with saturated salt solutions in situ. In this way the calibration is done with 3 different salt values. But doing the calibration this way is very time-consuming; requiring numerous changes of clothes, as access to the production locale is needed. In addition, there is no possibility to adjust in the range exceeding 75.3% relative humidity, due to the range of the salt. And finally there are numerous links in the traceability chain, leaving many possibilities for uncertainty.

In addition to calibrating the humidity sensor, the temperature sensor must also be calibrated. Traditionally this was done on site with a dry block temperature calibrator, but this is where the process has been innovative.

THE SOLUTION

At the pharmaceuticals plant they have found a smarter way to do “in situ” calibration, which has numerous advantages. They switched to a combined temperature/humidity sensor where the calibration constants are stored in the sensor. By doing this it is possible to do a so-called “separate calibration” – instead of calibration in situ of both temperature and humidity, the combined temperature and humidity sensors are “pre-calibrated” in the laboratory. This way, the technician brings a properly calibrated sensor with him from the lab and replaces the in situ sensor with the new one, and afterwards doing a calibration of the old one in the laboratory, ensuring both as-found and as-left values. Using this method, the plant increases the accuracy of the sensor calibration as it is calibrated in the laboratory with reference equipment calibrated with the extremely accurate JOFRA RTC Series temperature calibrator and a dew point hygrometer. This saves time and allows technicians to respond quickly, minimizing operational downtime. As an added bonus the plant has fewer links in the traceability chain than the conventional way, leaving fewer possibilities for error.

BENEFITS

With this new solution, the pharmaceutical plant has reaped many benefits.

1) Fewer links in the calibration chain leads to lower costs. These savings are both in regards to calibration standards, as well as less paperwork regarding traceability.
2) More efficient calibration means lower cost calibration. With the laboratory set-up it is possible to calibrate up to 14 temperature sensors at a time. Added to this, the calibration is automated and can be done overnight.
3) Minimized downtime. Using pre-calibrated sensors makes for quick exchange of faulty equipment and only change of clothes for employees needing access to the packaging locale.
4) More accurate calibration.

AMETEK’s JOFRA RTC family of dry block temperature calibrators plays an integral part in this smart calibration solution. Covering the widest temperature range, boasting excellent stability and high accuracy, the RTC family is a sure winner when an innovative, accurate temperature calibration is needed.