

Monitor Batch Quality from Reference Profile



PROCESS INDUSTRIES

Data Sources

- OSIsoft PI Event Frames: Fermentation and Diacetyl rest operations
- OSIsoft PI: Process Data (temperature)
- SQL: Quality Data (Diacetyl level)

Calculations & Conditions

- Reference profiles of average, and plus/minus three standard deviations.
- Deviation search creates capsules for boundary excursions.

Reporting & Collaboration

- Reference profiles of plus/minus three standard deviations are used as thresholds in a scorecard metric for a Trend View visual of boundaries.

Challenge

Across process industries, product quality depends on being able to maintain specific boundary conditions. In the case of brewing, the taste of the beer depends on achieving the specified diacetyl concentration – too high or too low and the beer just doesn't taste right.

The diacetyl rest process for lagers requires increasing the temperature at the end of fermentation. Offline diacetyl measurements are typically taken much less often than the online temperature readings, and the results from testing are not immediately available. So, monitoring temperature is critical to understanding the quality of the current batch.

A large brewery wanted to use data from historical good batches to create a profile against which to monitor temperature for process quality, enabling its process engineers to make adjustments if the batch were to fall outside of the expected temperature range. The temperature curve profile would be used to monitor all the diacetyl rest periods for how they track against a reference profile.

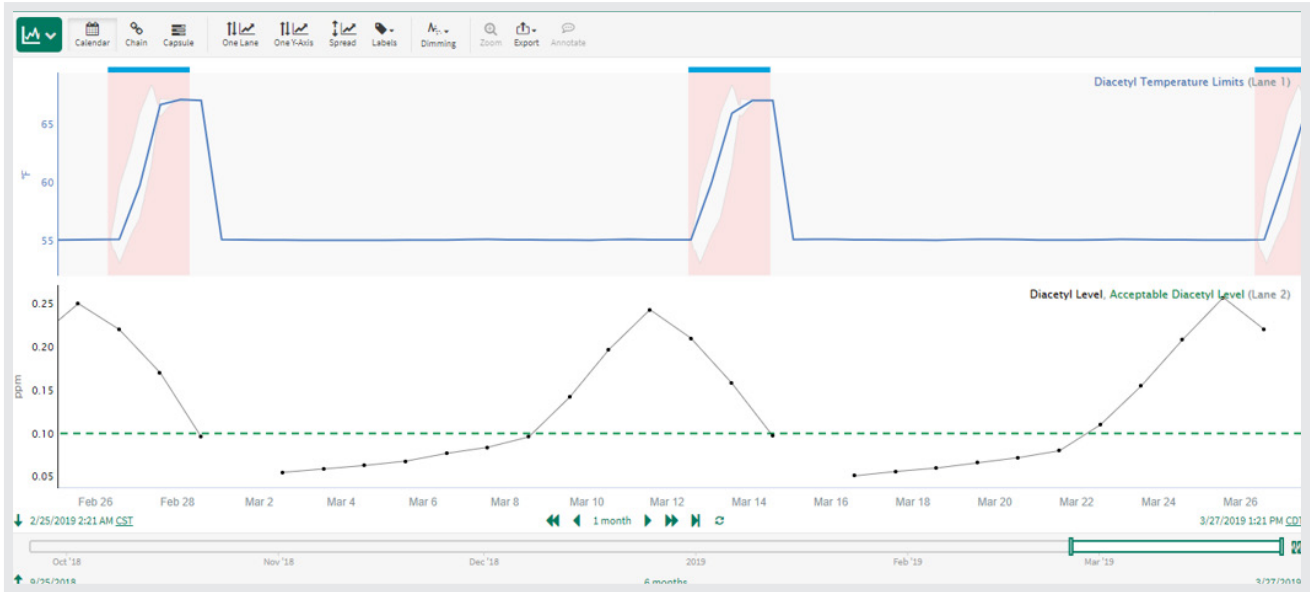
Solution

The engineering team selected five historical batches of good quality as inputs to create operating boundaries for the temperature to serve as a reference profile. The Seeq advanced analytics application was then used to highlight deviations in temperature from the statistically good boundary.

The engineers applied the reference profile to future batches, bringing in the latest online batch temperature data to monitor product quality, enabling adjustments if the batch deviates from the specified ranges.

Results

Monitoring batch quality from the reference profile enabled the early detection of process deviations, permitting for adjustments to shore up the quality of the beer. The end result: consistently good-tasting beer, due to just the right amount of diacetyl's buttery notes.



One month of Diacetyl rest batches with temperature tracking within boundaries and diacetyl level quality results below.




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