

Beating bacteria in fuel ethanol production

Easy-to-use fermentation control solution presented at FEW 2008



FOSS took part in BBI International's 2008 International Fuel Ethanol Workshop & Expo (FEW) June 16-19 Nashville, USA, and demonstrated the new BioFoss™ solution for rapid and easy control of the critical fermentation process.

At around a million gallons per tank, a lot of money is involved in fermenting fuel ethanol, with millions of dollars in process just in terms of grain. Infection with unwanted microbial activity literally eats away at this investment as the infecting bacteria convert sugar and ethanol to something else, either lactic or acetic acid.

Current methods for monitoring the process are largely based on HPLC analysis. This provides a wealth of information, but time-to-result, cost-per-sample and

the need for trained laboratory personnel remain barriers to gaining the level of information needed for effective fermentation control. In contrast, the new, easy-to-use BioFoss provides results within two minutes and allows anyone in the plant to test and test again at no additional cost.

The usability associated with the new solution was noted by John Caupert director of the National Corn-to-Ethanol Research Centre (NCERC). "Training is a huge issue in the industry," said Caupert, who has testified to the U.S. House of Representatives on the need for improved training in what he sees as one of the few growth areas for the U.S. economy at present. "The speed and ease of use would be a tremendous advantage," he says.

For Brian Wrenn, Research Director at

NCERC, the speed of the new monitoring option was especially interesting. He describes how, with conventional testing, there can be an eight to ten hour gap between tests. And then the actual test will take about an hour to deliver results: around 20 minutes for the test itself, plus the additional time for pulling the sample and setting up. "A lot can happen within an hour and it can be maddening to wait," he says.

Sniffing out acetic and lactic acid with FTIR technology

The BioFoss is based on Fourier Transform Infrared (FTIR) – a subject discussed by Ronny Pradon of FOSS at the FEW technical workshop. He explained that while near infrared (NIR) might be the obvious choice as an alternative to HPLC, studies by FOSS show that FTIR provides the greater sensitivity required for detecting individual components. In particular, measurements of acetic and lactic acid are essential for early detection of infection, but these are only present in low levels.

FOSS has vast experience of applying FTIR technology from applications in the dairy and wine industries. In addition to the BioFoss, FOSS also demonstrated the Infratec™ 1241 solution for intake control, including an ethanol yield prediction model available with the instrument. The InfraXact™ for analysis of coproduct quality was also on show.

The new BioFoss is now available for sale. For more information contact Biofuel Segment Manager, Johan Weimann: jw@foss.dk or visit www.foss.dk/biofuel

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