Evaluating the viability of process sensor technologies for measurement of sugar levels during fermentation

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Introduction

Fermentation is a natural process which can provide many process challenges. It is often a bottleneck in the winemaking process, leading to capacity constraints and risks to wine integrity.

Many variables can affect the fermentation process and resulting wine attributes, including:

- Temperature
- Yeast (type and vitality)
- (Grape) nutrient levels
- Dynamic treatment (agitation/pump-overs)

The sensor technologies

The Liquiphant vibrating fork sensor measures the density of the fermentation medium and this is converted into a direct Baumé reading. The conversion is carried out using the attached Density Computer, which can accommodate inputs from up to four different sensors at one time.

The Fermetrol probe determines the osmotic potential due to the concentration of sugar in the grape juice (must) and this is converted into an inferred Baumé reading.

The Micro-LDS sensor is a mass-flow device that measures changes in fluid density, which is then converted into Baumé readings.

Summary

These sensors show potential for measurement of Baumé in ferments. The technologies can be successfully applied if they are carefully integrated into the fermentation process.

These types of sensors can be applied on-line and off-line and offer a significant opportunity for the wine industry to:

- Reduce labour and analysis costs
- Have greater control of ferments
- Reduce the impact of slow or stuck ferments
- Improve product consistency and throughput