VinWizard

Wine Technology Solutions

AN INTRODUCTION TO
WINE TECHNOLOGY SOLUTIONS

www.vinwizard.com

The Fermetrol probe accurately measures levels of sugar and alcohol during a ferment and displays the information in a graphical format to the winemaker in real time. For those wineries with the VinWizard system installed, the winemaker can subsequently automate temperature control based on output from the probe. The winemaker can set a Brix rate of fall and the software will control the temperature within chosen boundaries to achieve this.

How does the probe work?
A hydro gel, much like a soft contact lens is infused into a ceramic container. The hydro gel expands and contracts to a consistent degree in relation to the level of sugar and alcohol in the tank. The probe has a strain gauge on the back of the ceramic container which measures the pressure changes as absorption takes place. We measure the expansion and convert it to an output VinWizard can use.

- *Reduce "out of control" ferments:* On-line access means the risk of problematic ferments are reduced if expectations are not being met (alarms can be sent via VinWizard SMS alarm functionality)

- *Less labour:* no need to do brix tests twice a day

- *Better quality:* better control has been proven to improve wine quality

- *Experimentation:* better control allows you to experiment with your ferment

- *Repeatability:* With on-line visibility of your ferment you can analyse the results and are more likely to be able to repeat the process

- *Power savings:* By only using cooling when it is required, this tool has the potential to save the winery money through a more efficient use of refrigeration

- *Reduce mistakes:* Mistakes do happen with ferments. Most are simply blended away. Wine is more likely to reach its full potential with better control

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The Fermetrol sensor is based around a semi-permeable water responsive polymer. This polymer determines the osmotic response to sugar levels in grape juice. The polymer is permeable to alcohol and responds to increases in alcohol via an expansive pressure in the polymer.

This sensor uses a highly stable ceramic membrane with a strain gauge bonded to the membrane at high temperatures to convert the expansive pressure of the polymer to an electrical signal.

When immersed in water the polymer absorbs the water and the expansive pressure in the polymer increases.
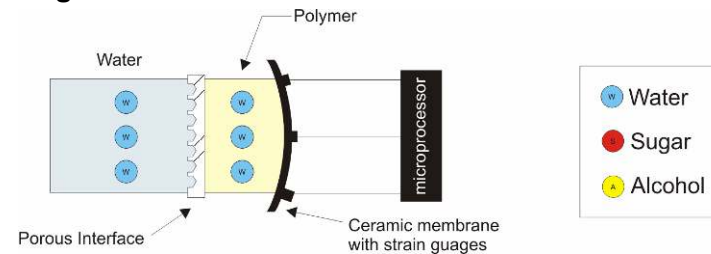

When immersed in juice, water is drawn from the polymer by the high osmotic potential of the juice. The polymer responds with a decrease in expansive pressure measured by the strain gauge.
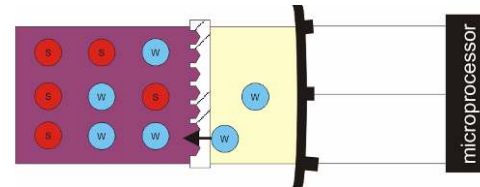

As the juice is fermented, sugar is converted to alcohol which flows into the polymer along with the water that returns to the polymer due to decreasing osmotic potential. This causes an increase in expansive pressure measured by the strain guage.
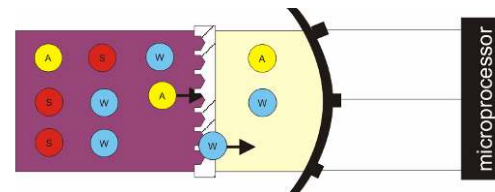
As more sugar is converted to alcohol, the osmotic potential of the juice continues to decrease and more alcohol and water is absorbed by the polymer. Expansive pressure proportionally increases until the fermentation is complete.

Fermetrol Software
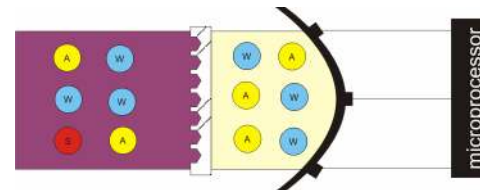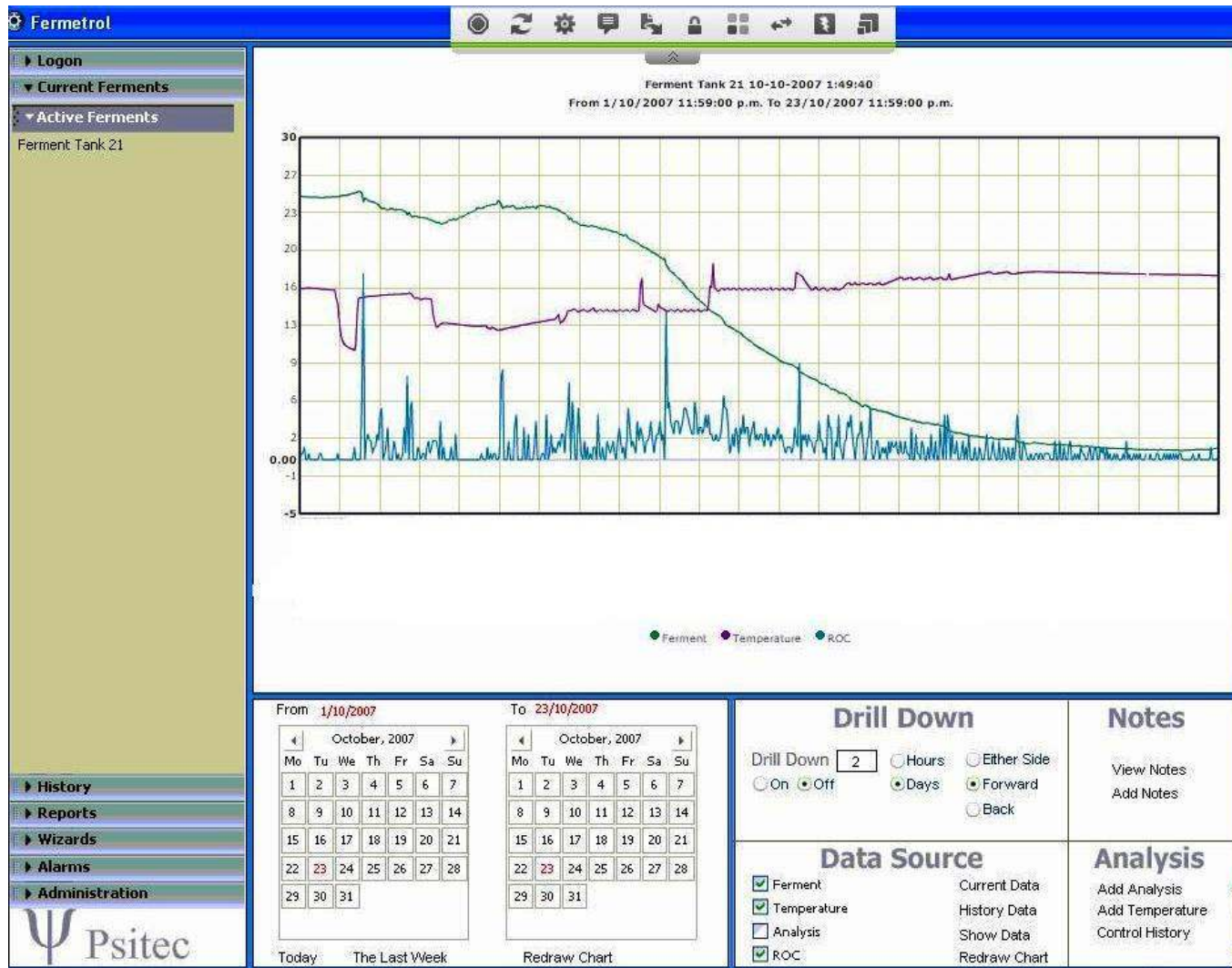
Ferment data is displayed in real time in an easy to understand graphical format. The software can be accessed remotely via the internet.

- Graphical display of the ferment, temperature and rate of change
- Ability to add time-stamped notes (e.g. inoculation, pumpover etc)
- Add your own analysis notes (for comparison purposes)
- Bring temperatures in from VinWizard
- Drill down to specific time periods
- Raise alarms when expectations are not being met
- Data is stored for future reference

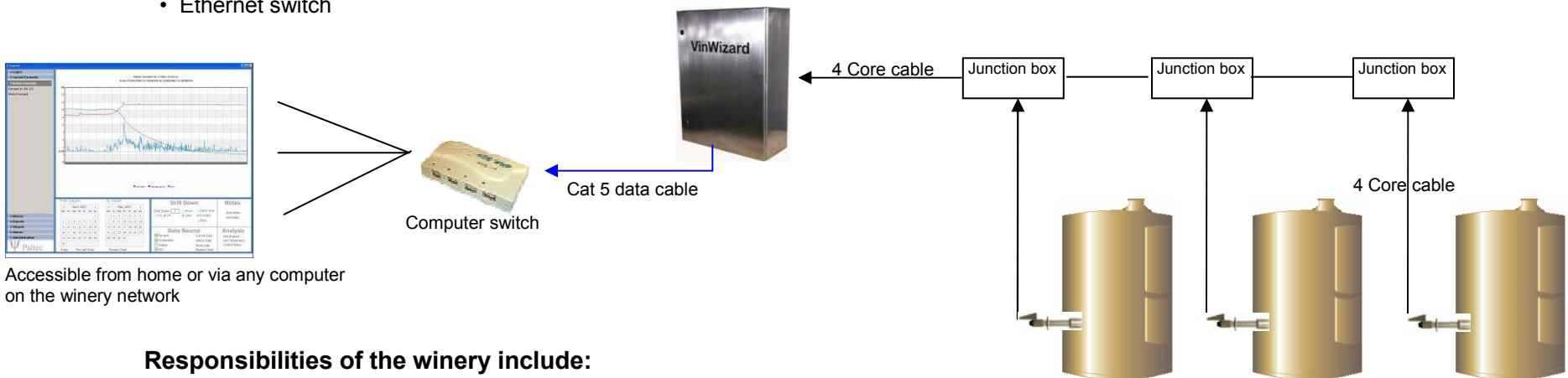❖ The above screen displays results achieved from a 2007 ferment in Spain.

▪The green line shows the familiar ferment curve

▪The purple line shows temperature

▪The blue line shows the "rate of change" at any particular point in time (peaks correspond to pump-overs)

The probe is sold as an integrated software/hardware solution. As with our VinWizard control system, we have made installation as foolproof as possible and is installable by any competent electrician.

The package consists of:

- The Fermetrol probe with a 4 core cable attached to be run from the tank to a junction box (as shown below)

- Tank fittings for the probe to be inserted through the tank wall

- Stainless steel panels. One panel will accommodate a fixed number of probes which is determined by the tank farm layout but could be up to 60 probes per panel. Panel components include:

  - Master Panel includes a "black box" which has the Fermetrol software installed (no additional computing hardware required)

  - Serial to Ethernet data conversion hardware

  - Power supply and filter

  - Ethernet switch

Accessible from home or via any computer on the winery network

Computer switch

Cat 5 data cable

4 Core cable

Junction box   Junction box   Junction box

4 Core cable

Responsibilities of the winery include:

- Mount each panel in proximity to the tanks it will service.

- Provide a hole in the tank, approximately one third the way up, and weld the supplied tank fitting to tank. If sufficient notice is given, the probe fittings could be supplied directly to the tank manufacturer.

- Run a twin twisted pair overall shielded cable from the panel to the probe (via junction box for multiple tanks) and terminate. Cross sectional area of cable dependent on cable length but approx .75mm.

- Run 110 V power to the panel

- Run Ethernet cable (cat 5) from computer network switch to the first panel and then daisy chain to remaining panels