

FOSS

FOSS IN WINE



ANALYTICS BEYOND MEASURE

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Today even the most accomplished wine producers face the challenge of getting more and more out of their raw materials while still improving their product quality. That is a tall order in an industry built on highly variable raw materials and quickly changing markets. But where nature can wreak havoc on your production, data harvests never fail.

Even in an industry driven by tradition and sensorial know-how, like wine, adding a new level of automation to your business helps ensure quality and consistency. You will be able to limit the number of human errors that slow you down. Scale your business faster, reduce manual labour and labour costs.

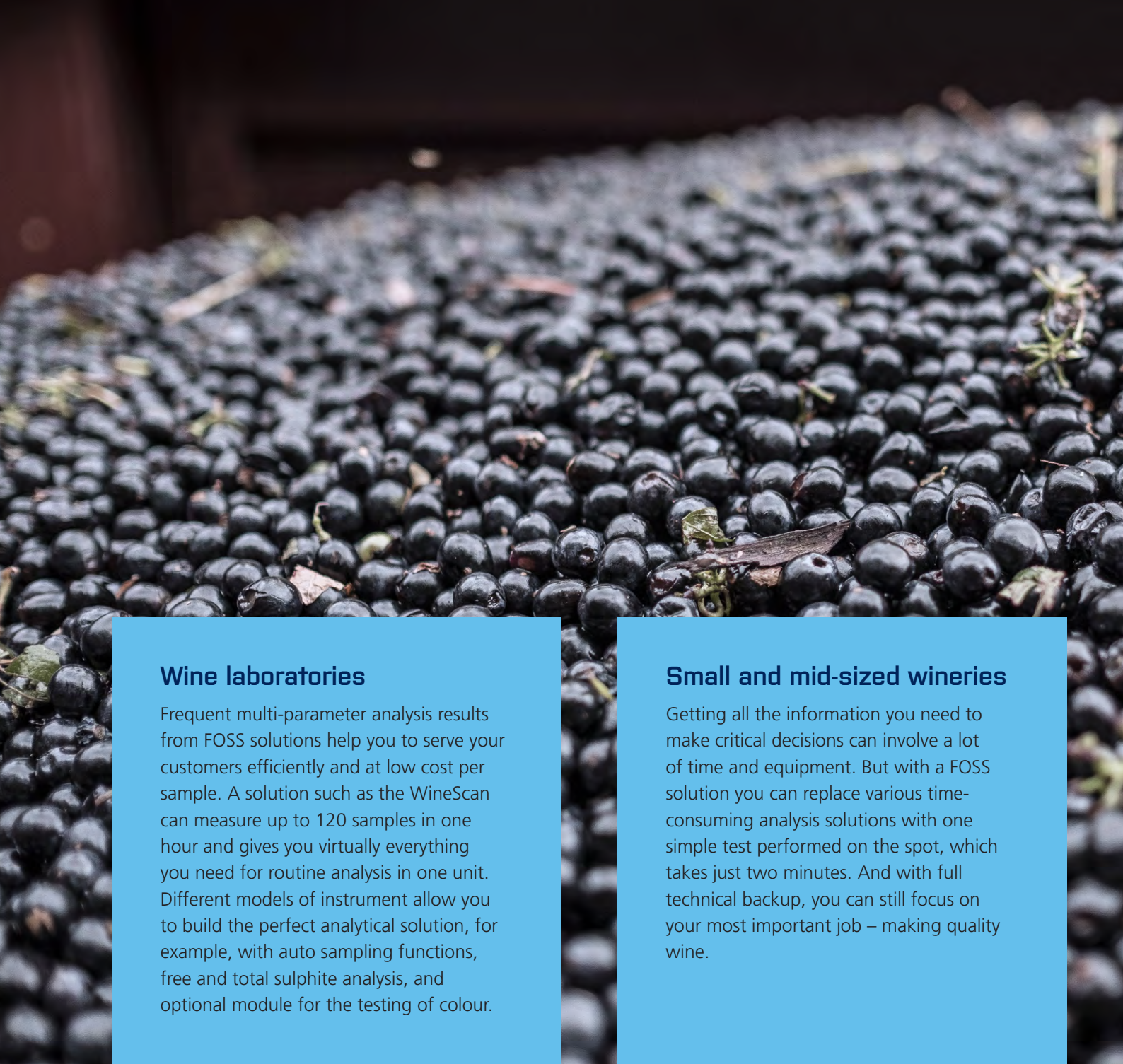
A lot can be lost and a lot can be won on the journey from raw material to finished product. That is why we have spent the last 60 years developing and refining instruments that measure every little step of the way. We translate measurements into mathematical algorithms that power automated systems, optimise your manufacturing process and make you grow. Helping you ensure and improve wine quality is what we do.

Our instruments give you the information that you need to minimise the waste of natural resources and optimise your business. Intelligent information management can turn existing production into efficient processes that generate less waste, bigger yields and higher quality.

We call it:
Analytics Beyond Measure







Wine laboratories

Frequent multi-parameter analysis results from FOSS solutions help you to serve your customers efficiently and at low cost per sample. A solution such as the WineScan can measure up to 120 samples in one hour and gives you virtually everything you need for routine analysis in one unit. Different models of instrument allow you to build the perfect analytical solution, for example, with auto sampling functions, free and total sulphite analysis, and optional module for the testing of colour.

Small and mid-sized wineries

Getting all the information you need to make critical decisions can involve a lot of time and equipment. But with a FOSS solution you can replace various time-consuming analysis solutions with one simple test performed on the spot, which takes just two minutes. And with full technical backup, you can still focus on your most important job – making quality wine.





QUALITY AND SCIENTIFIC KNOWLEDGE

– the perfect partnership for improving quality, efficiency and safety in winemaking

Large-volume producers

Why wait for vital information? Routine multi-parameter measurement gives you accurate information on the spot and just when you need it. You'll discover a new wealth of analytical data that allows you to track production more closely, protecting your investment at every stage. Any necessary intervention can be made at just the right moment, as you see your creation through from harvest all the way to bottling and shipping.

With a nose to the glass, an ear to the barrel and an experienced palate that no computer can ever match, sensory perception has been at the heart of winemaking for millennia. While these skills will always remain, rapid routine analysis with a FOSS instrument adds a new and exciting dimension in the form of regular objective information that no modern wine producer can afford to ignore.

Just as wine held to the light reveals valuable information to a trained eye, a small sample of wine exposed to the infrared analytical technology inside a FOSS solution pours forth a wealth of information that puts you in full control of the winemaking process. Maybe it just confirms your instinct and knowledge: "I knew I would get fermentation just right this time." Or maybe it doesn't: "The volatile acid levels in my barrels are heading north. I must act now."

From busy wine laboratories serving hundreds of customers to small-volume producers with little time for analysis, FOSS helps you exploit the power of routine analysis to complement your skills, experience and knowledge. Together, we form a unique partnership that paves the way for even higher levels of quality wine throughout the industry.

Whether you are a small winemaker, large bottling plant or independent wine analysis lab, FOSS can provide the wine analysis methods and solutions to suit your business.

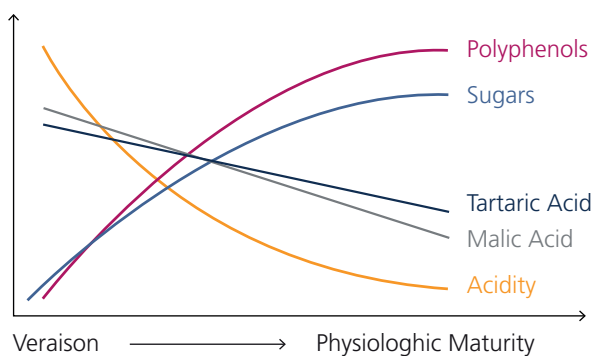


GRAPE MATURITY AND SEGREGATION

Decide when to pick, harvest smarter according to grape maturity, optimise the value of the harvest and pay the right price for grapes - objective measurements of maturity and grape soundness are invaluable during the busy harvest period. Plus, the availability of analytical data for multiple parameters allows a more sophisticated view of grape quality as a whole, encompassing both maturity and soundness.

Maturity

With a FOSS solution you can follow the development of grape maturity from the start of the veraison period through to harvest. Individual grape pulp parameters can be followed including fructose, glucose, total sugar, tartaric acid, malic acid and total acidity. With calibration options, it is even possible to analyse grape skin components such as anthocyanins and polyphenols after extracting the components. On-the-spot objective measurements help you to achieve the balance you are looking for between sugars and acids. You can get a complete picture of ripeness, both in terms of the physiological maturity of the grapes and through insight into the quality potential indicated by the ripeness of tannins and other phenolic compounds in the grapes that contribute to the colour, flavour and aroma of wine.

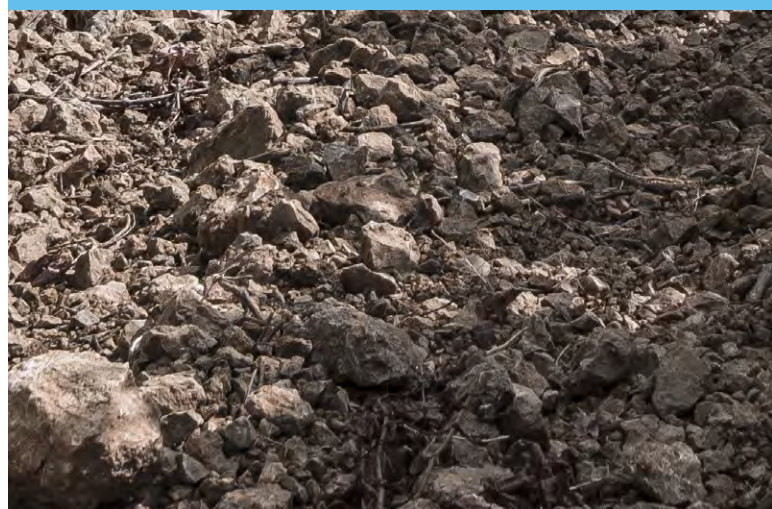


Rapid and objective measurements of maturity and grape soundness are invaluable during the busy harvest period



We save considerable time and gain better control over the maturity of our grapes.

Alexandra Lebosse, Chateau Pichon Longueville, Bordeaux, France
commenting on the value of rapid routine analysis



GRAPE SOUNDNESS – HOW IT WORKS

The FOSS grape soundness concept is based on the interaction between microorganisms and their media – the grapes. Each microorganism consumes metabolites from the grape (sugars, amino acids, etc) and produces microbial metabolites (ethanol, glycerol, etc). For instance, yeast transforms sugars to ethanol which is the fundamental process in vinification.

At harvest, no ethanol or other microbial metabolites is expected and, indeed, their absence is a prerequisite for grape soundness.

With FTIR, it is possible to measure those metabolites that may be present in high concentrations. In addition, the presence of the individual metabolites at different levels supplements the winemaker's local knowledge of history and climate to give a good indication of which microorganism is causing the disorder.

Multiple parameters give a comprehensive, multi-dimensional view. The ● scale indicates potential to predict a disorder, for example, ethanol is a good indication of indigenous yeast. Glycerol is also an indicator, but not as strong.

	Glycerol	Gluconic Acid	Acetic Acid	Ethanol	Citric Acid
Botrytis cinerea	●●●	●●			
Acetic bacteria		●	●●●		
Indigenous yeast	●			●●●	
Aspergillus niger		●●			●●●



FERMENTATION AND MATURATION

Routine analysis helps you to protect your investment by keeping a close eye on the processes involved in winemaking, for example, with timely information that helps to avoid stuck fermentation. Such information also helps you to develop your approach. Or, if you want to check every barrel, just go ahead. With rapid analysis to support you, you can push the boundaries of quality with powerful combinations of parameters available simultaneously.

Alcoholic fermentation

Moving on to alcoholic fermentation, you can check that the yeast has the right nutrients to grow. An analysis for Yeast Assimilable Nitrogen allows you to supplement nitrogen deficient must with diammonium phosphate at the start of fermentation to provide adequate nitrogen levels.

You can leave out the guesswork during fermentation by tracking the conversion of sugars to ethanol. The measurements also provide a valuable reference when tasting for those complex components, only discernable to the experienced palate.

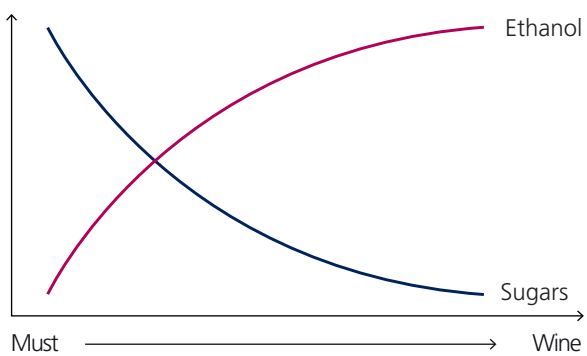
Malolactic fermentation

During malolactic fermentation, rapid analysis allows you to track conversion of malic acid to lactic acid with a simple convenient test. If you are using barrels, you can test each one at no extra cost. Another aspect for the cost discussion is that so much more data is available because tests can be run as often as required. If a strange result comes up, it is easy to do a re-test on the spot.

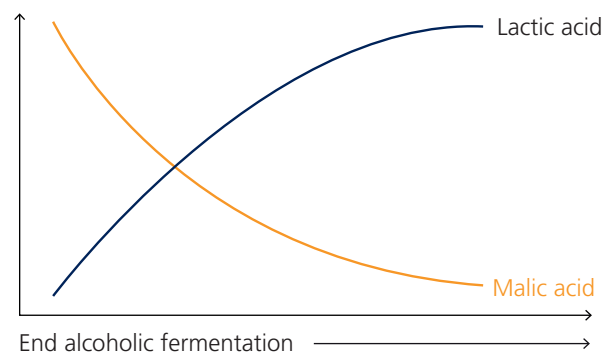


The timely, objective measurements give you the backup you need to avoid rash decisions. You can relax and follow through on instinct towards a better

result, for example close monitoring of malolactic fermentation and volatile acid helps you decide with confidence.



Leave out the guesswork by tracking the conversion of sugars to ethanol.



Rapid analysis allows you to track conversion of malic acid to lactic acid with a simple convenient test



**The WineScan™ can deliver
20 critical QC parameters
simultaneously in 30 seconds.**



Parameter	Purpose
Glucose / Fructose	Has all sugar been used or is there a danger of fermentation restarting?
pH	How stable is the wine?
Acetic acid	Is vinegar being produced due to acetobacter?
Ethanol	Does it match the figure on the label? Will it affect stability?
Malic acid	Will levels affect stability and cause problems after bottling?
Total acidity	Is acetic acid being formed?
Sulphur dioxide	Is it within legal limits? Is there a risk of spoilage and oxidation?
Polyphenol index	Does it match your targets for colour and tannins?



Some commonly analysed finished wine components.

BLENDING AND BOTTLING

You have got your wine where you want it. Now, as you go into the final stages of production, rapid and convenient analysis of sulphur dioxide helps you to keep a close eye on levels prior to bottling and blending. Rapid analysis of parameters such as ethanol, pH and volatile acid then provides an essential, immediate reference for blending, bottling and labelling.

You can ensure that you match profiles exactly both before and after the blending process. A simple pre-bottling check for signs of activity in the wine allows you to bottle with confidence.

Tell your customers

Multiple analysis results from a single sample will help you meet demands from customers for increasingly detailed product information. And you can complete labelling and administrative tasks precisely with

accurate analysis using a small sample volume.

Smart sulphur dioxide analysis

The option to measure sulphur dioxide with the WineScan is a new major breakthrough in wine analysis. It is now possible to accurately analyse free and total sulphur dioxide in parallel with other parameters in just over one minute.

Time-to-result compares favourably with around 15 minutes per test with existing routine methods or longer for laboratory reference methods. The system is also considerably more convenient, reducing manual work and associated risks of operator error. Results are delivered alongside the many other quality parameters provided by the WineScan analyser. This gives you a convenient on-screen comparison against parameters, such as pH and ethanol, of potential interest in combination with sulphur dioxide.

**FIND THE RIGHT ROUTINE ANALYSIS
SOLUTION AND GET THE MOST OUT
OF IT, YEAR AFTER YEAR**





Ready to go: FOSS solutions are supplied with robust ready-to-use calibrations. On top of that, FOSS offers a range of support packages that take care of everything from hardware updates to calibration adjustments, updates, and maintenance.

Together we will customise a support package that fits with your business.

Online support

Using FOSS network support you can just get on with your measurements without having to worry about instrument performance and calibration updates. Taking advantage of FossManager™ networking software your WineScan™ or OenoFoss™ can be connected to a central control centre where experts in FTIR analysis can keep an eye on instrument performance. This can be combined with on-site support visits. New calibrations can also be uploaded remotely.

Wide variety of new applications available

Ready-made, transferable calibrations allow for the simultaneous analysis of all major parameters. With unprecedented instrument stability, calibrations are transferable from one instrument to another and powerful calibration development software enables calibration development for new applications.

Traceable results

Facilities in the software platform allow you to improve control through traceable measurements and respond to growing demands for the documentation of results. Or just look back over the years and track the trend in test results, helping you to define your strategy for the next vintage.



At least 80% of global wine production is measured with a FOSS solution

FOURIER TRANSFORM INFRARED

– providing new light on traditional methods

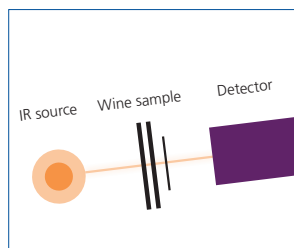
Introduced to the wine industry by FOSS in 1999, routine analysis created a revolution in wine analysis and, over the years, has proven its value to wineries and analytical laboratories.

The success of WineScan was founded on an innovative use of Fourier Transform Infrared (FTIR) – an analytical technology that is ideal for rapid multi-parameter analysis of liquid samples.

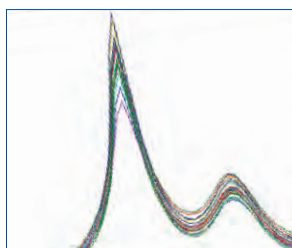
Today, winemakers around the world use analytical solutions based on FTIR to protect and enhance the quality of their products. And the developments continue with new parameters such as free and total SO_2 .

THE PRINCIPLE OF FTIR ANALYSIS

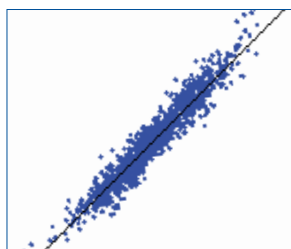
The principle of FTIR routine analysis involves infrared scanning of must or wine samples. Through mathematical modelling, the concentration of wine constituents is determined within 30 seconds.



1. Infrared light through sample



2 Spectrum analysis



3. Calculations

Total Acid g/l	3,5
Ethanol %	12,1739
VA g/l	3,5
OD 520	1,911

4. Result on screen



An aerial photograph of a vineyard in a hilly region. The vines are arranged in neat rows across the slopes. Several workers are visible, some bent over harvesting grapes. The background shows more vineyard rows and distant mountains under a clear sky.

Data storage with Foss Integrator software

Facilities in the user software platform for FOSS wine solutions allow you to improve control through traceable measurements and respond to growing demands for the documentation of results. Or just look back over the years and track the trend in test results, helping you to define your strategy for the next vintage.

Automatic recording of measurement activity provides lists of results for improved quality assurance routines and traceability. An intuitive operator interface is designed for routine operation, for instance it is easy to switch from must to wine measurement.

The information gained from both liquid and gas phase provides the basis for an accurate measurement. During times when you only need the traditional liquid parameter results you can switch off the SO₂ measurement and get your results in just 30 seconds as normal.

