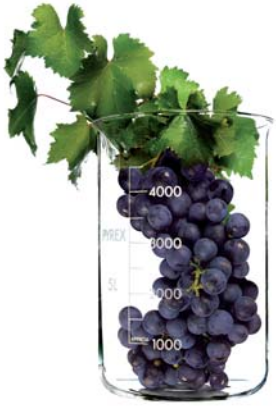
Wine Analysis Made Easy

ENOLOGY

BioSystems
REAGENTS & INSTRUMENTS

ENOLOGY



Since its inception in 1981, BioSystems has offered reliable, efficient analytical systems to laboratories worldwide.

Our head offices in Barcelona occupy 16,000 m^2 and are staffed by a young, highly qualified team of employees devoted to the research, development, production and marketing of a wide variety of instruments and reagents of utmost quality and outstanding features.

Building on our teamwork and interest in new markets and business units, **BioSystems has developed a new system for wine analysis.**

Thanks to the high-level scientific expertise of BioSystems staff, we continue to create technologically innovative products that meet the growing needs of laboratories.

We are also conducting ongoing research to improve the procedures used to obtain raw materials and optimize reagent manufacturing.

All research and manufacturing processes are governed by stringent control standards, and our quality systems are regulated by various European and international standards.

At BioSystems we stress the need for innovation and work tirelessly to gain your confidence and loyalty.

We are fully committed and determined to serve you better than anyone else, knowing that this is no easy challenge.

Your satisfaction is the reason for our work and our enthusiasm.

Sincerely yours,

Antonio Elduque
Managing Director

BioSystems
REAGENTS & INSTRUMENTS

INDEX

Available in near future:
Ascorbic Acid and Histamine

Acetaldehyde

Enzymatic analysis for acetaldehyde determination

ADVANTAGES

Stable working reagent for 3 weeks
Ready-to-use dedicated reagent
Liquid calibrator included in the kit

Acetaldehyde is one of the components of the oxidative chain of alcoholic fermentation. Acetaldehyde is also formed in wine ageing processes by ethanol oxidation. Acetaldehyde concentration is closely related to SO_2 content. This combination is responsible for antioxidant activity.
This is the reason why acetaldehyde is one of the main quality control parameters for wine.

Acetaldehyde in the sample yields NADH (by the following reaction), which can be measured by spectrophotometry.

$$\text{Acetaldehyde} + NAD^+ \xrightarrow{\text{ALDH}} \text{Acetic Acid} + NADH + H^+$$

Kit volume:	50 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	200 mg/L
Limit of detection:	0.1 mg/L

Acetic Acid

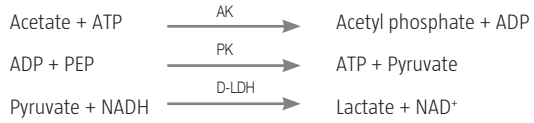
Enzymatic method for acetic acid determination

ADVANTAGES

- Stable working reagent for 1 month
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Acetic acid is produced during alcohol and malolactic fermentation and helps enhance flavors and aromas. When the wine is aerated or remains in contact with air, acetic bacteria can multiply, leading to a problem known as "acetic spoilage". The characteristic aroma of this spoilage is due to ethyl acetate.

Acetate in the sample consumes NADH (by the following reaction), which can be measured by spectrophotometry.



Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	1.3 g/L
Limit of detection:	0.03 g/L

Citric Acid

Enzymatic method for citric acid determination

ADVANTAGES

Stable liquid reagent until the expiration date
Stable working reagent for 1 month
Ready-to-use dedicated reagent
Liquid calibrator included in the kit

Citric acid is an organic acid naturally present in wine that contributes to total wine acidity. Its content is higher in white wine, as the content in red wine drops during malolactic fermentation yielding volatile acids. The permissible legal limit is 1 g/L, and its concentration must be controlled by wine exporters.

Citrate in the sample yields oxaloacetate due to the action of the enzyme known as lyase citrate. All oxaloacetate from citrate in the sample is converted into L-malic acid by the enzyme L-malate dehydrogenase. This enzyme uses NADH as a coenzyme and is oxidized to NAD+. The disappearance of NADH may be read by spectrophotometry.

$$\text{Citrate} \xrightarrow{\text{CL}} \text{Oxaloacetate + acetate}$$

$$\text{Oxaloacetate + NADH + H}^+ \xrightarrow{\text{L-MDH}} \text{L-malate + NAD}^+$$

Kit volume:	50 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	400 mg/L
Limit of detection:	11 mg/L

D-Gluconic Acid / D-Gluconolactone

Enzymatic method for gluconic acid determination

ADVANTAGES

Stable liquid reagent until the expiration date
Ready-to-use dedicated reagent
Liquid calibrator included in the kit

D-gluconic acid is an indicator of grape deterioration and sanitary condition.

D-gluconic acid in the sample yields NADPH (by the following reaction), which can be measured by spectrophotometry.

$$\text{D-gluconate} + \text{ATP} \xrightarrow{\text{GK}} \text{D-gluconate-6-P} + \text{ADP GK}$$

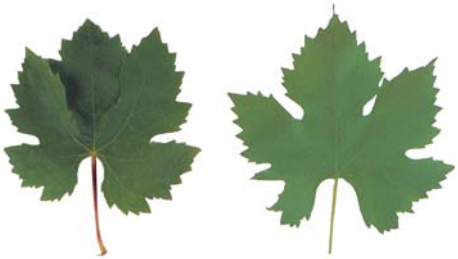
$$\text{D-gluconate-6-P} + \text{NADP}^+ \xrightarrow{\text{6-PGDH}} \text{ribulose-5-P} + \text{NADPH} + \text{CO}_2 + \text{H}^+$$

D-gluconolactone can be determined according to the same principle after alkaline hydrolysis.

$$\text{D-gluconolactone} + \text{H}_2\text{O} \xrightarrow{\text{pH=11}} \text{D-gluconate}$$

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	2 g/L
Limit of detection:	0.003 g/L

Ref. 12811



D-Lactic Acid

Enzymatic method for D-lactic acid determination

ADVANTAGES

Stable liquid reagent until the expiration date.
Ready-to-use dedicated reagent
Liquid calibrator included in the kit

Excess D-lactic bacteria can inhibit alcohol fermentation, converting some sugars into D-lactic acid. This is one of the main problems in the wine-making process. Levels above 0.3 g/L of D-lactic acid indicate bacterial contamination.

D-lactic acid in the sample yields NADH (by the following reaction), which can be measured by spectrophotometry.

$$\text{D-Lactate} + \text{NAD}^+ \xrightarrow{\text{D-LDH}} \text{Pyruvate} + \text{NADH}$$

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	0.25 g/L
Limit of detection:	0.004 g/L

Ref. 12801

L-Lactic Acid

Enzymatic method for L-lactic acid determination

ADVANTAGES

Stable liquid reagent until the expiration date
Ready-to-use dedicated reagent
Liquid calibrator included in the kit

L-lactic is the product of the metabolism of malic acid during the malolactic fermentation. Causing decreased acidity and softening the wines

L-lactic acid in the sample yields NADH (by the following reaction), which can be measured by spectrophotometry.

$$\text{L-Lactate} + \text{NAD}^+ \xrightarrow{\text{L-LDH}} \text{Pyruvate} + \text{NADH}$$

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	3 g/L
Limit of detection:	0.02 g/L

Ref. 12802

L-Malic Acid

Enzymatic method for L-malic acid determination

ADVANTAGES

Stable liquid reagent until the expiration date
Stable working reagent for 4 months
Ready-to-use dedicated reagent
Liquid calibrator included in the kit

L-malic acid is responsible for the acidic and green apple flavor. Its fermentation yields L-lactic acid and causes wine to lose its acidity and gain softness and aroma.

L-malic acid in the sample yields NADH (by the following reaction), which can be measured by spectrophotometry.
The equilibrium of this reaction moves toward L-malic acid formation. The enzyme glutamate-oxaloacetate transaminase (GOT) causes the equilibrium to shift by eliminating oxaloacetate, which is converted into L-aspartate in the presence of L-glutamate.

$$\text{L-Malate} + \text{NAD}^+ \xrightarrow{\text{L-MDH}} \text{Oxaloacetate} + \text{NADH}$$

$$\text{Oxaloacetate} + \text{L-Glutamate} \xrightarrow{\text{GOT}} \text{L-Aspartate} + \text{2-Oxoglutarate}$$

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	4 g/L
Limit of detection:	0.016 g/L

Pyruvic Acid

Enzymatic method for pyruvic acid determination

ADVANTAGES

Stable liquid reagent until the expiration date
Stable working reagent for 2 months
Ready-to-use dedicated reagent
Liquid calibrator included in the kit

Pyruvic acid is an organic acid naturally present in wine and one of the acids that most influences its body and mouth feel. Pyruvic acid is a result of the fermentation process and contributes to the organoleptic properties of wine, but must be controlled because selective sulfite-binding shortens the life of the wine.

Pyruvate in the sample yields oxalacetate due to the action of the enzyme known as D-lactate dehydrogenase. This reaction consumes NADH that is oxidized to NAD+ and the disappearance of the latter can be measured by spectrophotometry.

$$\text{Pyruvate} + \text{NADH} \xrightarrow{\text{D-LDH}} \text{Oxaloacetate} + \text{NAD}^+$$

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	400 mg/L
Limit of detection:	6 mg/L

Tartaric Acid

Colorimetric analysis for tartaric acid determination

ADVANTAGES

Stable liquid reagent until the expiration date
Ready-to-use dedicated reagent
Liquid calibrator included in the kit.

Tartaric acid is the main acid of wine that can become insoluble, forming various salts. This acid produces the fruity aromas and freshness of wines and is the most commonly used acidifier.

Any tartaric acid in the sample reacts with vanadium salt in acidic medium, forming a colored complex that is assayed by spectrophotometry.

Tartaric acid (TART) + Vanadium salt (V) $\xrightarrow{pH=4}$ [V-TART]

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 520 nm
Measurement range:	0.06 to 6 g/L
Limit of detection:	0.06 g/L

Ammonia

Enzymatic method for ammonia determination

ADVANTAGES

Stable liquid reagent until the expiration date
Ready-to-use dedicated reagent
Liquid calibrator included in the kit

Low nitrogen levels have been related to slow fermentation or sulfi de production. Conversely, high levels can lead to microbial instability and production of ethyl carbonate.

Ammonia in the sample consumes NADH (according to the following reaction), which is then assayed by spectrophotometry.

$$NH_4^+ + NADH + H^+ + 2-Oxoglutarate \xrightarrow{GLDH} Glutamate + NAD^+$$

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	200 mg/L
Limit of detection:	3 mg/L

Ref. 12809

Primary Amino Nitrogen (PAN)

Colorimetric analysis for primary amino nitrogen determination

ADVANTAGES

Stable liquid reagent until the expiration date
Stable working reagent for 12 months
Ready-to-use dedicated reagent
Liquid calibrator included in the kit

Nitrogen compounds (molecules containing a primary amine nitrogen) in must and wine play a key role in fermentation and the potential of microbial stability.

Any molecules in the sample that contain a primary amino nitrogen react with o-phthaldialdehyde (OPA) in the presence of a reducing agent in basic medium, yielding a chromogen that is assayed spectrophotometrically.

$$NH_2R + OPA \xrightarrow[\text{reducing agent}]{ph=9,5} [OPA - NH_2R]$$

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	400 mg/L
Limit of detection:	1 mg/L

Ref. 12807

Calcium - Eno

Colorimetric analysis for calcium determination

ADVANTAGES

Stable two-reagent liquid until the expiration date
Ready-to-use dedicated reagent
Liquid calibrator included in the kit

Calcium is present in wine at concentrations of 6 to 165 mg/L. The concentrations may be higher, depending on the soil characteristics, some deacidification processes, etc. Instability due to calcium tartrate appears at 4 to 7 months of fermentation and depends largely on alcohol content, pH, temperature, etc. Controlling these precipitates is key to ensuring wine quality.

Calcium in the sample reacts with 2,7-[bis(2-arsonophenylazo)]-1,8-dihydroxynaphthalene-3,6-disulfonic acid (Arsenazo III). The color increase is directly proportional to the calcium concentration of the sample.

$$\text{Calcium (Ca)} + \text{Arsenazo III} \xrightarrow{pH=6,5} [\text{Ca-(Arsenazo III)}]$$

Kit volume:	80 mL
Method:	Two-reagent differential determination reading at 635 nm
Limit of linearity:	180 mg/L
Limit of detection:	2 mg/L

Ref. 12824

Color

Colorimetric analysis for color determination

ADVANTAGES

Stable liquid reagent until the expiration date
Ready-to-use dedicated reagent

Wine color plays a major role in the impression of quality. Color is also an important indicator in many wine-making processes. Regular use of this test allows enologists to document and confirm their own impressions.

The wine sample is diluted in a buffer solution that does not alter color-related properties. Absorbance reading at 420 nm, 520 nm and 620 nm allows the chromatic characteristics to be calculated.

Kit volume:	80 mL
Method:	One-reagent end point determination, readings at 420, 520 and 620 nm
Limit of linearity:	16.5 (A_{420}, A_{520} and A_{620})
Limit of detection:	0.113 (A_{420}), 0.144 (A_{520}) and 0.121 (A_{620})

Ref. 12816

Copper

Colorimetric analysis for copper determination

ADVANTAGES

- Stable liquid reagent until the expiration date
- Stable working reagent for 2 months
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Copper is a metal that clearly originates in the process of vine-growing. The main source is phytosanitary treatments of vineyards to prevent mildew. During grape-harvesting, the copper content may be 4 to 6 mg/L. During fermentation its concentration decreases to 0.2-0.3 mg/L due to the formation of copper sulfides or the presence of yeasts that fix the copper contained in the medium. The International Organisation of Vine and Wine (OIV) has set a maximum acceptable limit of copper of 1 mg/L.

Any copper in the sample reacts with 4-(3,5-dibromo-2-pyridylazo)-N-ethyl-N-sulfopropylaniline (PAESA) sodium salt in acidic medium and in the presence of a reducer. The color increase is directly proportional to the copper concentration of the sample.

$$\text{Copper (Cu)} + 2\ \text{PAESA} \xrightarrow[\text{reducing agent}]{\text{pH=5.1}} \text{PAESA}\ [\text{Cu(PAESA)}_2]$$

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 560 nm
Limit of linearity:	7 mg/L
Limit of detection:	0.4 mg/L

Ref. 12814

Glycerol

Colorimetric analysis for glycerol determination

ADVANTAGES

Stable one-reagent liquid until expiration date
Ready-to-use dedicated reagent
Liquid calibrator included in the kit

Glycerol is an indicator of the quality of the finished wine and is extremely important for the mouth-feel. High glycerol concentrations add sweetness, body and fullness to the wine.

Glycerol in the sample yields (by the following reaction), a colored complex that is assayed by spectrophotometry.

$$\text{Glycerol} + \text{ATP} \xrightarrow{\text{glycerol kinase}} \text{Glycerol-3-P} + \text{ADP}$$

$$\text{Glycerol-3-P} + O_2 \xrightarrow{\text{G-3P-oxidase}} \text{Dihydroxyacetone-P} + H_2O$$

$$2\,H_2O_2 + \text{4-minoantipyrine} + \text{4-chlorophenol} \xrightarrow{\text{peroxidase}} \text{Quinone-imine} + 4\,H_2O$$

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 500±20 nm
Limit of linearity:	20 g/L
Limit of detection:	0.24 g/L

Ref. 12812

Iron - Eno

Colorimetric analysis for iron determination

ADVANTAGES

Stable liquid reagent until the expiration date
Ready-to-use dedicated reagent
Liquid calibrator included in the kit

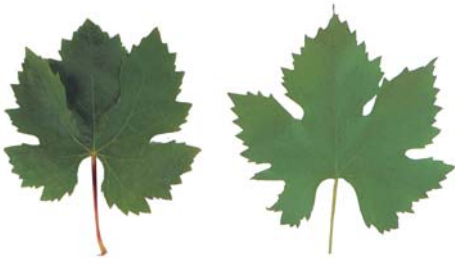
Metal components in the wine can be originated by the grapes or the machinery used to make the wine. A high iron content can cause clouding due to a lack of solubilization, thus affecting the color and limpidity of the wines.

Any iron in the sample reacts with 3-(2-pyridyl)-5,6-bis (4-phenylsulfonic)-1,2,4-triazine (ferrozine) sodium salt in acidic medium and in the presence of a reducing agent. The color increase is directly proportional to the iron concentration of the sample.

$$\text{iron (Fe)} + \text{ferrozine} \xrightarrow[\text{reducing agent}]{\text{pH=4,1}} [\text{Fe-ferrozine}]$$

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 560 nm
Limit of linearity:	30 mg/L
Limit of detection:	0.4 mg/L

Ref. 12817



D-Glucose/D-Fructose

Enzymatic method for D-glucose/D-fructose determination

ADVANTAGES

Stable liquid reagent until the expiration date
Working reagent stable until the expiration date
Ready-to-use dedicated reagent
Liquid calibrator included in the kit

This test indicates the best moment for grape harvesting and allows alcohol fermentation to be monitored.
Widely used to determine the dryness of the wine before bottling.

D-fructose and D-glucose in the sample generate NADH (by the following reaction), which can be measured by spectrophotometry. The configuration of these reagents allows D-glucose/D-fructose (total sugars) to be determined if the enzyme PGI is added or D-glucose to be determined if it is not.

$$\text{D-fructose} + \text{ATP} \xrightarrow{\text{HK}} \text{fructose-6-phosphate} + \text{ADP HK}$$

$$\text{D-glucose} + \text{ATP} \xrightarrow{\text{HK}} \text{glucose-6-phosphate} + \text{ADP HK}$$

$$\text{fructose-6-phosphate} \xrightarrow{\text{PGI}} \text{glucose-6-phosphate PGI}$$

$$\text{glucose-6-phosphate} + \text{NADP}^+ \xrightarrow{\text{G6P-DH}} \text{gluconate-6-phosphate} + \text{NADPH} + \text{H}^+$$

Kit volume:	120 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	8 g/L
Limit of detection:	D-Glucose: 0.01 g/L D-Glucose/D-Fructose: 0.01 g/L

Ref. 12800

Polyphenols

Colorimetric analysis for polyphenols determination

ADVANTAGES

- Stable liquid reagent until the expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Phenol components significantly enhance the antioxidant properties, color and mouth-feel of red wines. The importance of these phenol components in sensory perception requires assay at all stages of the wine-making process.

Any polyphenols in the sample react with Folin-Ciocalteu´s reagent in basic medium. The color increase is directly proportional to the polyphenols concentration of the sample.

$$\text{Polyphenols + Folin-Ciocalteu's reagent (RF)} \xrightarrow{\text{pH=10,9}} \text{[Polyphenols-FC]}$$

Kit volume:	80 mL
Method:	Two-reagent differential determination reading at 670 nm
Limit of linearity:	3000 mg/L
Limit of detection:	60 mg/L

Ref. 12815

Potassium

Colorimetric analysis for potassium determination

ADVANTAGES

- Stable liquid reagent until the expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

The amount of potassium in the grape must varies between 600 and more than 2500 mg/L in certain varieties of red wine. During véraison, soil potassium moves toward the fruit where it forms soluble potassium bitartrate. Alcohol and low temperatures can reduce its solubility, leading to precipitation.

Potassium in the sample consumes NADH (by the following reaction), which can be measured by spectrophotometry.

$$\text{Phosphoenolpyruvate + ADP} \xrightarrow[\text{PK}]{\text{K}^+} \text{Pyruvate + ATP}$$

$$\text{Pyruvate + NADH + H}^+ \xrightarrow{\text{LDH}} \text{Lactate + NAD}^+$$

Kit volume:	80 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	1500 mg/L
Limit of detection:	8 mg/L

Ref. 12823

Sucrose / Total Sugar

Enzymatic method for sucrose or total sugar determination

ADVANTAGES

Stable liquid reagent until the expiration date
Stable working reagent for 3 months
Ready-to-use dedicated reagent
Liquid calibrator included in the kit

Precise analysis of sucrose or total sugar is important for many winecellars in two winemaking operations.

• Sparkling wine (cava, champagne, etc.) production: the process may vary according to the method used, but basically consists of adding sucrose once alcoholic fermentation has been carried out, in order to achieve a second fermentation that produces CO_2 that is retained in the wine.

• Chaptalization: a technique that consists of adding sucrose to the must when, for various reasons, the grape does not ripen sufficiently and lacks glucose/fructose. This enhances alcoholic fermentation and yields a product with a higher alcohol content. This technique is not approved in all countries.

Sucrose, D-fructose and D-glucose in the sample generate NADPH (by the following reaction), which can be measured by spectrophotometry. The configuration of these reagents allows sucrose or sucrose/D-glucose/D-fructose (total sugars) to be determined.

$$\text{Sucrose} + H_2O \xrightarrow{\beta\text{-Fructosidase}} \text{D-glucose} + \text{D-fructose}$$

$$\text{D-fructose} + \text{ATP} \xrightarrow{\text{HK}} \text{Fructose-6-phosphate} + \text{ADP}$$

$$\text{D-glucose} + \text{ATP} \xrightarrow{\text{HK}} \text{Glucose-6-phosphate} + \text{ADP}$$

$$\text{Fructose-6-phosphate} \xrightarrow{\text{PGI}} \text{Glucose-6-phosphate}$$

$$\text{Glucose-6-phosphate} + \text{NADP}^+ \xrightarrow{\text{G6P-DK}} \text{Glucose-6-phosphate} + \text{NADPH} + \text{H}^+$$

Kit volume:	60 ml
Method:	One-reagent end point or two-reagent differential determination, reading at 340 nm
Limit of linearity:	Sucrose 4 g/L, Total sugar: 8 g/L
Limit of detection:	Sucrose 0.08 g/L, Total sugar 0.07 g/L

Ref. 12819

Free Sulfite

Colorimetric analysis for free sulfite determination

ADVANTAGES

Stable liquid reagent until the expiration date
Ready-to-use dedicated reagent
Liquid calibrator included in the kit

Most sulfur dioxide added to the must or wine combines with different organic compounds. This is the predominant fraction in wine; however, there is another fraction that is not combined, namely, free SO_2. Although it is present in lower amounts, its antiseptic and antioxidant properties are superior to those of combined sulfite.

Any free sulfites in the sample react with 4,4'- (4-iminocyclohexa-2,5-dienylidene) methyl) dianiline (pararosaniline) dye in the presence of formaldehyde and in acidic medium. The color increase of the sample is directly proportional to the free sulfite concentration.

$$SO_2 + \text{pararosaniline} \xrightarrow[\text{formaldheheyde}]{pH=1,0} [\text{pararosaniline-formaldehyde-}SO_2]$$

Kit volume:	80 mL
Method:	Two-reagent differential determination reading at 560 nm
Limit of linearity:	150 mg/L
Limit of detection:	1 mg/L

Ref. 12813

Total Sulfite

Colorimetric analysis for total sulfite determination

ADVANTAGES

Stable liquid reagent until the expiration date
Ready-to-use dedicated reagent
Liquid calibrator included in the kit

Sulfite is the main preservative of wines and musts, due to its antiseptic properties on yeasts and bacteria; it also has antioxidant properties. According to Council Regulation (EC) No 1493/1999 and Council Regulation (EC) Nº 1622/2000, the sulfur dioxide content of wine is limited, as it is considered to be a slightly toxic substance from the point of view of its effects on human physiology.

Total sulfites in the sample react with 5-5'-dithio-2-nitrobenzoic (DTNB) acid in basic medium. Cleavage of the disulfide bond (R-S-S-R) of DTNB by a sulfite molecule yields the 5-mercaptan-2-nitrobenzoate molecule, which absorbs at 405 nm. The color increase of the sample is directly proportional to the total sulfite concentration of the sample.

$$SO_2 + \text{R-S-S-R (DTNB)} \xrightarrow{pH=8,2} \text{R-S-}SO_2 + \text{S-R}$$

Kit volume:	200 mL
Method:	Two-reagent differential determination reading at 405 nm
Limit of linearity:	400 mg/L
Limit of detection:	1 mg/L

Ref. 12806

Enologycal

Multiparameter calibrator

ENOLOGYCAL is a multiparameter calibrator with five synthetic matrix liquid levels (5 x 10 mL). It contains various analaytes at adequate concentrations for the calibration of the measurement procedures.

The traceability of the results in samples to reference materials or systems of higher metrological hierarchy is only ensured when the reagents and measurement procedures recommended by BioSystems are used.

Parameter	U	1	2	3	4	5
Acetic acid	g/L	0.15	0.30	0.60	0.90	1.20
Citric acid	g/L	45	90	180	270	360
D-Gluconic acid	g/L	0.20	0.40	0.80	1.20	1.60
D-Lactic acid	g/L	0.028	0.056	0.113	0.169	0.225
L-Lactic acid	g/L	0.34	0.68	1.35	2.03	2.70
L-Malic acid	g/L	0.45	0.90	1.80	2.70	3.60
Ammonia	mg/L	23	45	90	135	180
D-Glucose	g/L	0.90	1.80	3.60	5.40	7.20
D-Glucose/D-Fructose	g/L	0.90	1.80	3.60	5.40	7.20
Glycerol	g/L	0.113	0.225	0.450	0.675	0.900
PAN	mg/L	45	90	180	270	360
Total sugar	g/L	0.90	1.80	2.70	3.60	5.40

Ref. 12818

Control Wine (white and red)

Multiparameter control

Control Wine (white and red) is a wine (10 x 5 mL) that contains various components at adequate concentrations for quality control in laboratories. The product is designed for intra-laboratory quality control and is supplied with acceptable value intervals.

Traceability is only ensured when the reagents and measurement procedures recommended by BioSystems are used.

Componente	U
Acetic acid	g/L
Ammonia	mg/L
D-Gluconic acid	g/L
D-Glucose	g/L
D-Glucose / D-Fructose	g/L
Glycerol	g/L
L-Lactic acid	g/L
L-Malic acid	g/L
Primary Amine Nitrogen	mg/L
Polyphenols	mg/L
Tartaric acid	g/L

Ref. 12821 / 12822

Y15 / Y25 / Y350 are Open Analyzers.

In conjunction with the reagent line, the BioSystems Analyzers make it possible to monitor the entire vinification process. The system adjusts to the various sample types that the enologist needs to analyze.

15

TECHNICAL SPECIFICATIONS

Cod. 83106

Random Access Automatic Analyzer

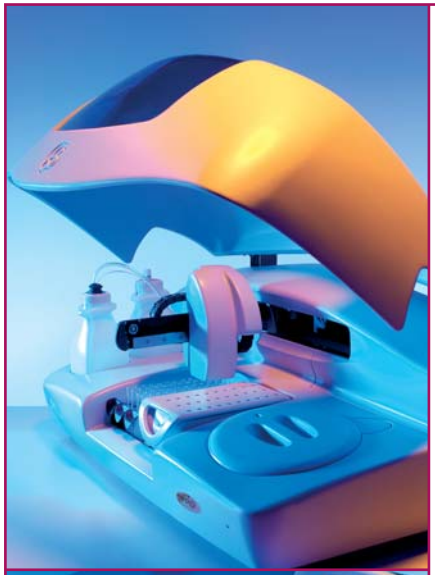
Direct photometric reading on the reaction rotor

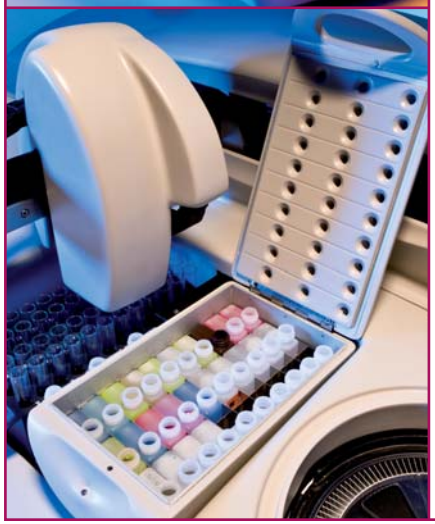
Test rate	150 tests/hour
Number of rack positions	4
Number of samples per rack	24
Maximum number of samples	72
Sample tubes	ø13 mm, ø15 mm (max. height 100 mm)
Pediatric vials	ø13 mm
Number of reagents per rack	10
Max. number of reagents	30
Reagent bottles	20 mL and 50 mL
Programmable reagent volume	10 µL - 550 µL
Programmable sample volume	3 µL - 80 µL
Removable methacrylate rotor	
Number of wells	120
Automatic pre- and post-dilutions	
Dilutions using a single calibrator	
Reaction volume range	180 µL – 800 µL
Measurement range	-0.05 A to 3.0 A
Basic filter drum setting	340, 405, 420, 520, 560, 600, 620, 635, 670 nm
Dimensions	840 x 670 x 615 mm (L x W x H)
Weight	45 Kg

25

TECHNICAL SPECIFICATIONS

Cod. 83107





Random Access Automatic Analyzer

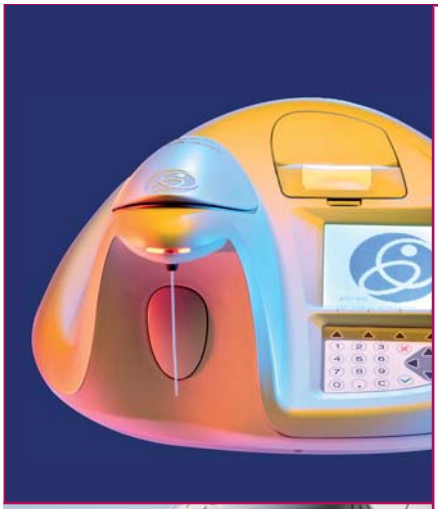
Direct photometric reading on the reaction rotor

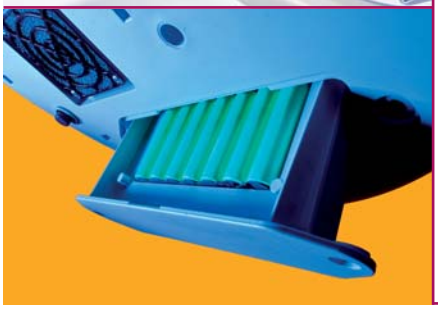
Test rate	240 tests/hour
Cooled reagent positions	30
Positions for uncooled racks	3 (multipurpose rack)
Number of samples per rack	24
Maximum number of samples	72
Sample tubes	Ø 13 mm, Ø 15 mm (max. height 100 mm)
Pediatric vials	Ø 13 mm
Number of reagents per rack	10
Max. number of uncooled reagents	20
Reagent bottles	20 mL and 50 mL
Programmable reagent volume	10 µL – 440 µL
Programmable sample volume	3 µL – 40 µL
Removable methacrylate rotor	
Number of wells	120
Automatic pre- and post-dilutions	
Dilutions using a single calibrator	
Reaction volume range	180 µL – 800 µL
Measurement range	– 0.05 A to 3.0 A
Basic filter drum setting	340, 405, 420, 520, 560, 600, 620, 635, 670 nm
Dimensions	1080 x 695 x 510 mm (L x W x H)
Weight	73 kg

Y 350

TECHNICAL SPECIFICATIONS

Cod. 80176





OPTICAL SYSTEMS

Range of measurement: 0,2 - 3,5 Absorbance all wavelengths
Wavelengths: 280, 340, 405, 420, 505,
520, 560, 620, 635, 670, 750 nm
Light Source: LEDs
Settings: monochromatic and bichromatic

THERMOSTAT SYSTEM

Peltier system from 25-40 °C

FLUIDIC SYSTEM

Continuous flow system with peristaltic pump incorporated
Stepper motor pump operation
Sipping volume can be programmed from 100 µL to 5 mL
Automatic adjustment of sample volumen
Automatic adjustment of sample position

PRINTER SCREEN AND KEYBOARD

Thermic printer
Screen: graphic LCD lighted screen 320 x 240 px
Keyboard: tactile membrane

METHODS OF CALCULATION

Absorbance
End Point
Differential Mode
Fixed Time

CALIBRATION

Factor
Calibrator
Calibration Curve

CALIBRATION CURVE

Up to 8 Calibration points
Up to 3 replicates per point

QUALITY CONTROL

2 controls per test
Levey-Jennings control chart
Westgard´s Rules

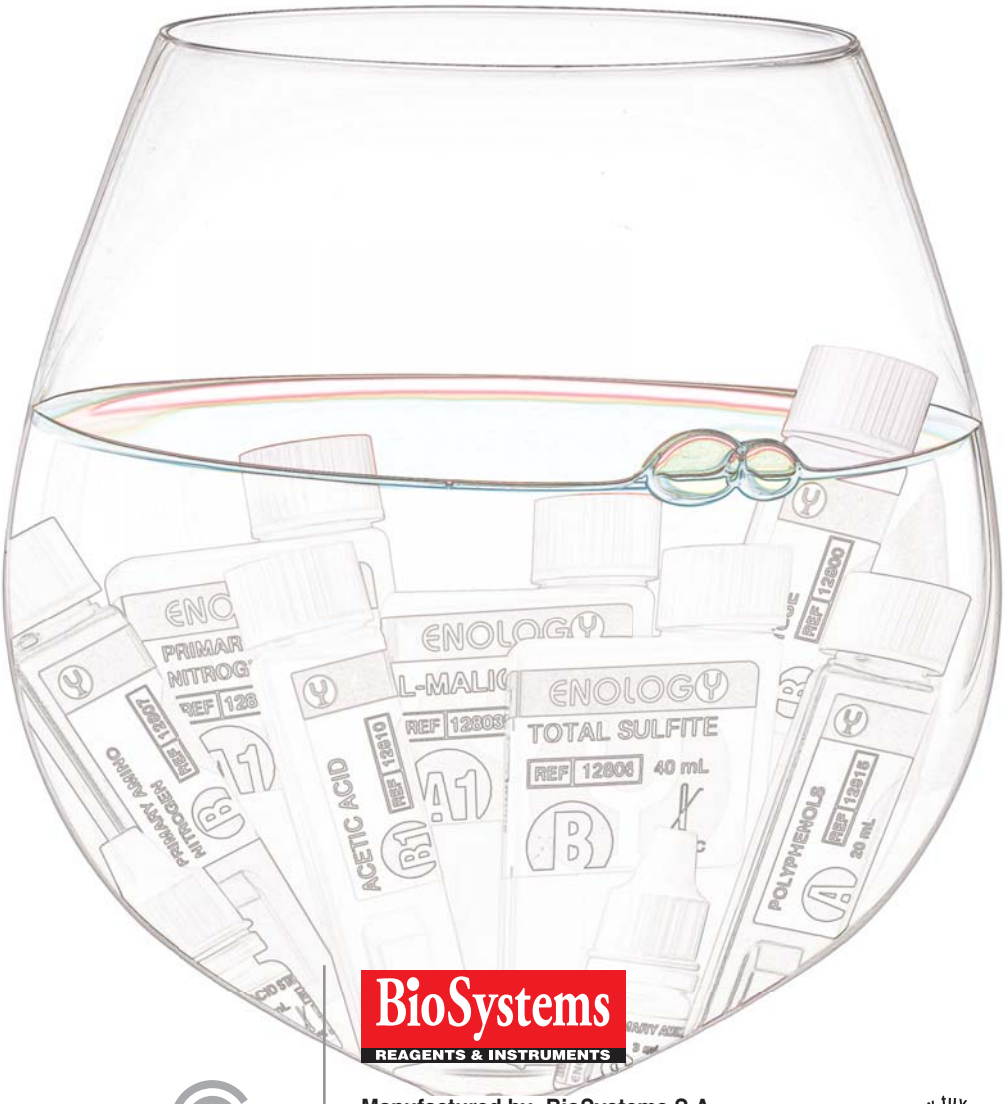
INSTALLATION CHARACTERISTICS

Voltage: 100V-240 V
Frequency: 50/60 Hz
Maximum power: 30 W
Temperature: 10-35 °C
Max Rel humidity: 75 %
Height: <2000 m
Dimensions: 420 x 350 x 216 mm
Weight: 4 kg

ACCESSORIES

Battery Pack
- Capacity 2000 mAh
- Duration: 2 hrs

1 and 10 mm flow quartz cuvette
10 mm flow glass cuvette
1 mm glass cuvette + adapter
10 mm quartz cuvette



BioSystems
REAGENTS & INSTRUMENTS

Ginper Group

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- EN ISO 9001
- EN ISO 13485

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