The Beverage Alcohol Laboratory (BAL) located at 6000 Ammendale Road, Beltsville, Maryland, is part of the Scientific Services Division of TTB. The laboratory provides technical expertise and assistance to other divisions within TTB by analyzing approximately 1,200 alcoholic beverage samples (wine, malt beverages, and distilled spirits) in a year across a variety of programs.

TTB's Beverage Alcohol Laboratory (BAL) is interested in purchasing a capillary electrophoresis (CE) instrument that would be capable of performing BAL's previously developed test method for determining organic acids in alcoholic beverages. This would be used for determination of standard of identity for Formula submissions with lab analysis, Product Integrity investigations, and the Alcohol Beverage Sampling Program (ABSP). The instrument also allows BAL to possibly expand their capabilities to determine sugars (erythritol, fructose, glucose, sucrose, maltose, and lactose) used in nutritional labeling assessment, and cyanide in alcoholic beverages which is a limited ingredient.

Method Parameters

The instrument should be able to analyze, separate, and quantitate the following organic acids in alcoholic beverages such as wines, malt beverages, and distilled spirits:

Tartaric Acid	Acetic Acid
Malic Acid	Lactic Acid
Citric Acid	Gluconic Acid
Succinic Acid	Fumaric Acid

Instrument Conditions include:

Parameter	Value
Injection Pressure	100 mbar
Capillary Temperature	20 °C
Voltage	-25 kV
Detector	Signal 350/20 nm, Reference 200/10nm

Instrument Specifications

Pressure system
Programmable with -100 to +100 mbar on inlet
Flushing with 1 bar or with high pressure 2–12 bar
Vial pressurization with high pressure 2–12 bar on inlet and/or outlet

Safety features
Current leak detection low current limit
Liquid leak sensor
Safety sensors at door and cover disabling high voltage
Vial sensor

Injection modes
Self correcting injection system with injection from inlet or outlet

Programmable range	up to 10,000 seconds
Pressure	–100 to +100 mbar
Electrokinetic	–30 to +30 kV

Autosampler/ fraction collector
50-position carousel
All vials are randomly accessible from inlet or outlet end of capillary
Temperature control with external waterbath with vial temperature from 10–40 °C
(non-condensing conditions, minimum waterbath temperature +1 °C)

Replenishment
Satellite station for refilling of inlet or outlet buffer vials with fresh buffer for automatic, continuous operation.
Selectable buffer levelling.

Vials
100 µL (polypropylene or glass) with resealing snap caps
1 mL (polypropylene) with resealing snap caps
2 mL (glass) with resealing snap caps

Capillary cassette

High-speed forced-air cooler with Peltier element

Temperature range	10 °C below ambient, up to 60 °C (min. 10 °C cassette temperature)
Minimum total capillary length	33 cm
Capillary compatibility	365 µm o.d.

Detector

Real time UV-Visible diode-array detector (190–600 nm)

Temperature controlled

Wavelength accuracy	1 nm
Response time	0.025 to 10 s
Light source	prealigned deuterium or high brightness lamp
Signals	up to eight signals simultaneously, full spectral acquisition with Agilent ChemStation
Sensitivity	1 µM 4-hydroxy-aceto-phenon injected at 50 mbar*5 sec, 3 x 50 µm bubble cell capillary, signal/noise >6* (50 mM borate buffer pH 9.3, 25 kV)
Baseline noise	<50 µAU (at 2 sec response time)*
Linear dynamic range	$1x10^4$ (3x50 µm bubble cell capillary)*

Raw data channels

Detector signals and spectrum, voltage, current, leak current, power, cassette temperature, pressure, lamp voltage and detector temperature

Diagnostic functions

RFID tag for lamp, early maintenance feedback, supported by Agilent Lab Advisor software with integrated diagnosis test suite

System control

Operating with graphical user interface under WindowsXP (SP3)

Time programmable parameters	Time programmable parameters: voltage, current, power, polarity, pressure, inlet and outlet vial, capillary temperature, pre and post-run conditioning with pressure and/or voltage, Replenishment, fraction collection**

Electrophoresis power

Voltage range	setable 0 to ± 30 kV supply
Current	setable 0–300 µA
Power	setable 0–6 W

Operation under constant voltage, current or power Programmable polarity switch

CE specific software

Mobility report, time corrected areas, pI calibration and bio polymer size calibration

Power requirements	
Line voltage	100-240 V, max. 300W
Line frequency	50-60 Hz

Acquisition Requirements

The winning proposal will meet the conditions specified above in the Method Parameters and Instrument Specifications sections. It will also include the following items in line item format:

1. CPU including monitor and printer
2. Familiarization at installation
3. Method consulting on site
4. Organic Acids Kit
5. The ability to add multiple detectors if needed in the future.