applied biosystems® by life technologies™

3500xL Genetic Analyzer

Comparison to the 3130xL Genetic Analyzer

Green Benefits

- Energy-efficient
- Less hazardous materials
- Less material usage
- Decreased fuel consumption and greenhouse gas emissions for transport
- Less waste

Introduction

Life Technologies is committed to designing products with the environment in mind—it's one more step toward a smaller footprint. This fact sheet provides the rationale behind the environmental claims that the Applied Biosystems® 3500xL Genetic Analyzer is more energy efficient, utilizes fewer raw materials, and is less hazardous for disposal than its predecessor, the 3130xL Genetic Analyzer. The 3500xL Genetic Analyzer is safer and easier to recycle because it is designed free of key hazardous substances commonly found in electronic products (e.g., lead, mercury, cadmium, hexavalent chromium, and polybrominated flame retardants). This product also weighs less and thereby requires less fuel consumption and generates less greenhouse gas emissions for transport. Use of fewer materials also translates to less waste at end-of-life.

Product Description

The 3500 Genetic Analyzer platform can run a wide variety of applications—including de novo sequencing and resequencing (mutational profiling)—as well as microsatellite analysis, MLPA™, AFLP®, LOH, MLST, and SNP validation or screening. The majority of applications can be run on a single polymer and capillary array, and the 3500 Series Data Collection Software integrates seamlessly with several downstream Applied Biosystems® software packages to provide comprehensive analysis of genetic data.

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Green Features

Energy-Efficient

The 3500xL Genetic Analyzer draws 57.89% less energy when idling (Table 1) and 85.1% less energy to process one sample plate (Table 2), compared to the 3130xL Genetic Analyzer.

Table 1. Energy Usage When Idling.

	Average Usage (kW)	Run time (hr)	kW-hr
3500xL	0.08	1.00	0.08
3130xL	0.19	1.00	0.19
Energy Conservation			**57.89%**

For comparison of energy usage when performing a run, the 3500xL instrument was set up to run on nominal voltage, 117.6 VAC @ 60 Hz. The type of protocol used was "FastSeq50_POP7xl". 24 wells of a 96-well plate were prepared with BDTv3.1 sequencing standard according to product insert instructions. The plate was injected once with the FastSeq50_POP7xl module.

The 3130xL instrument was set up to run on nominal voltage, 208.62 VAC @ 60Hz. The type of protocol used was "FastSeq50_POP7". The entire 96-well plate was prepared with BDTv3.1 sequencing standard according to product insert instructions. The plate was injected once with the FastSeq50_POP7 module.

Table 2. Energy Usage When Performing a Run.*

	Average Usage (kW)	Run time (hr)	kW-hr
3500xL "FastSeq50_POP7xl"	0.13	1	0.13
3130xL "FastSeq50_POP7"	0.72	1.21	0.876
Energy Conservation			**85.16%**

* Condition: Instrument running one sample plate according to product insert instructions.

Other Considerations for Energy Measurements

1. 1. Instrument energy usage was measured at different nominal voltages. This has a negligible impact on energy measurements.
2. 2. The number of wells processed per instrument run was different (16 wells prepared on a 96-well plate for the 3130xL, vs. 24 wells prepared on a 96-well plate for the 3500xL). The number of wells were prepared and run per the instruments' recommended protocols.

Less Hazardous

The Applied Biosystems® 3500xL Genetic Analyzer was engineered to meet the European Union's Restriction of Hazardous Substances (RoHS) Directive (Directive 2002/95/EC)—eliminating lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBBs), and polybrominated diphenyl ethers (PBDEs).

Fewer Resources/Less Waste

Manufacturing the 3500xL Genetic Analyzer requires nearly 37% less material than its predecessor, the 3130xL Genetic Analyzer (Table 3). Furthermore, by designing the instrument to have a smaller footprint (reduction of nearly 8%), efficiency of laboratory space use is improved.

Table 3. Instrument Weight and Footprint.

	Run time (hr)	kW-hr
3500xL	82	3721 cm^2 (61 cm x 61 cm)
3130xL	130	4055.2 cm^2 (74 cm x 54.8 cm)
Material Reduction	**36.92%**	**8.24%**

Headquarters
5791 Van Allen Way | Carlsbad, CA 92008 USA | Phone +1.760.603.7200 | Toll Free in the USA 800.955.6288
www.lifetechnologies.com

life technologies™