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User Bulletin

ABI PRISM® 377 DNA Sequencer

ABI™ 373 DNA Sequencer with XL Upgrade

June 2, 1998 (updated 04/2001)

SUBJECT: Cleaning Glass Plates to Eliminate Temporary Loss of Signal

Overview

The loss of signal for a short period of time is a phenomenon that occurs sporadically on ABI PRISM 377 and ABI 373 instruments. It occurs during runs for both ABI PRISM® DNA Sequencing Analysis and GeneScan® Analysis Software applications.

This problem manifests itself as a band of little or no signal across the entire width of the gel image. It usually occurs between 140 to 200 base pairs, and typically lasts the equivalent of 20 to 40 base pairs. Following this band, signal strength usually returns to normal.

Corresponding electropherograms show a decline in peak intensity to background levels, usually returning to normal peak heights 20 to 40 base pairs later.

In the past, solutions for solving this problem have included:

- Replacing reagents
- Replacing glass plates
- Cleaning glass plates with a mild acid wash

In most cases, however, the problem returned. Sometimes it was even worse than before, particularly when mild acid washes were performed. Consequently, we have continued researching the cause of this problem.

Applied Biosystems

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Research Results

Contaminant Molecules Detected

During our analysis of glass plates used when this phenomenon occurs, a series of contaminant molecules attached to the surface of the plates were detected. These contaminants include surfactants, fatty acids, and long chain polymers.

We believe that the accumulation of one or more of these contaminants leads to the occurrence of temporary loss of signal. Furthermore, we suspect that acid washes only add to the phenomenon by creating more hydroxyl groups on the plate surface to bind the contaminating molecules.

Rinsing Glass Plates with Hot Deionized Water

Rinsing glass plates with hot deionized water was found to effectively remove suspect contaminants from glass plates, thereby eliminating the temporary loss of signal. Deionized water raised to a temperature of 195°F (approximately 90°C) was used for our tests.

We also found that the use of detergents such as Multi-Terge, Alcojet, and Alconox is not necessary.

The critical parameters for effectively cleaning plates are:

- Quality of the deionized water used
- Water temperature, pressure, and volume
- Consistency

Using a Dishwasher

We found that cleaning glass plates in a laboratory dishwasher with a hot deionized water rinse cycle is the most effective means of consistently and thoroughly removing surface contaminants, thereby eliminating temporary loss of signal.

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Recommendations for Cleaning Glass Plates

Use a Dishwasher

We strongly recommend cleaning glass plates in a laboratory dishwasher with a hot (at least 195°F/90°C) deionized water rinse cycle. Using a dishwasher helps ensure glass plates are cleaned effectively and consistently every time. Deionized water is required for the rinse cycle only.

Additional recommendations:

- Connect the dishwasher to a high-grade, deionized water source.
- Clean plates as soon as possible once the gel is removed.
- Rinse residual gel from plates before loading in a dishwasher.
- Initially use the longest deionized water rinse option on the dishwasher, followed by a drying cycle. After some experimentation, you may be able to reduce the rinse time.
- Do not use a detergent.
- Avoid excessive handling of dry plates with ungloved hands.

Recommended Dishwashers

The following dishwashers have been found to work well. A customized plate rack may be required.

Item	Part Number	Supplier
Lancer 1600 dishwasher with facility for drying	Lancer 1600 UP	Lancer USA Inc. 705 West Highway 434 Longwood, Florida 32750 Telephone: 407-332-1855 Lancer UK Ltd. 1 Pembroke Avenue Waterbeach, Cambridge CB5 9QR Telephone: 44-01223-861665 Fax: 44-01223-861990
Sequencing plate rack for Lancer dishwasher (50 plate capacity)	SPR 16	Lancer USA Inc. as listed above

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Item	Part Number	Supplier
Labconco Undercounter SteamScrubber Washer/Dryer	15-352-801	Fisher Scientific U.S. Headquarters 585 Alpha Drive Pittsburgh, Pennsylvania 15238 Customer Service: 1-800-766-7000 Fax: 1-800-926-1166 Internet: http://www.fishersci.com

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