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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.
Research Results

<table>
<thead>
<tr>
<th>Contaminant Molecules Detected</th>
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<tbody>
<tr>
<td>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.</td>
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<tr>
<td>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.</td>
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<table>
<thead>
<tr>
<th>Rinsing Glass Plates with Hot Deionized Water</th>
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<tbody>
<tr>
<td>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.</td>
</tr>
<tr>
<td>We also found that the use of detergents such as Multi-Terge, Alcojet, and Alconox is not necessary.</td>
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<td>The critical parameters for effectively cleaning plates are:</td>
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<tr>
<td>♦ Quality of the deionized water used</td>
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<td>♦ Water temperature, pressure, and volume</td>
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<td>♦ Consistency</td>
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<tr>
<th>Using a Dishwasher</th>
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<tbody>
<tr>
<td>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.</td>
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</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
<th>Supplier</th>
</tr>
</thead>
</table>
| 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 |

<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sequencing plate rack for Lancer dishwasher (50 plate capacity)</td>
<td>SPR 16</td>
<td>Lancer USA Inc. as listed above</td>
</tr>
<tr>
<td>Item</td>
<td>Part Number</td>
<td>Supplier</td>
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<td>-------------------------------------------</td>
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</tr>
<tr>
<td>Labconco Undercounter SteamScrubber Washer/Dryer</td>
<td>15-352-801</td>
<td>Fisher Scientific</td>
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<tr>
<td></td>
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<td>U.S. Headquarters</td>
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<tr>
<td></td>
<td></td>
<td>585 Alpha Drive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pittsburgh, Pennsylvania</td>
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<td></td>
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<td>Customer Service:</td>
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<td></td>
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<td>1-800-766-7000</td>
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<td>Fax: 1-800-926-1166</td>
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<td>Internet:</td>
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<td></td>
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<td><a href="http://www.fishersci.com">http://www.fishersci.com</a></td>
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