Instrument Front-End Cleaning
Procedure
2 of 30
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</table>
## Revision Log

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<th>Reason for Change</th>
<th>Date</th>
</tr>
</thead>
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<tr>
<td>D5026488 A</td>
<td>First release of document.</td>
<td>December 2011</td>
</tr>
<tr>
<td>RUO-IDV-05-0385-A</td>
<td>Updated for use with new <em>Customer Familiarization Checklist</em>.</td>
<td>July 2013</td>
</tr>
<tr>
<td>RUO-IDV-05-0385-B</td>
<td>Title updated. New template applied.</td>
<td>October 2013</td>
</tr>
</tbody>
</table>
Follow this procedure to clean the front end for these mass spectrometers:
• Skimmer-equipped systems (3200 and 4000 series systems)
• QJet® ion guide-equipped systems (4500, 4600, 5000, 5500, 5600, and 6500 series systems)

**Note:** For safety information, refer to the *System User Guide* or the *Safety Practices Guide*.

### Clean the Vacuum Interface

Inspect and clean the front-end components, including the curtain plate; the orifice plate; the QJet® ion guide, which includes the IQ0 lens, or skimmer; and the Q0 rod set.

**Regular front-end cleaning:**
• Minimizes unscheduled mass spectrometer downtime.
• Maintains optimum sensitivity.
• Helps avoids more extensive cleaning, which might require a service visit.

To help prevent instrument contamination, perform routine cleaning regularly: clean up to and including the front of the orifice plate. (This can be done daily.) If sensitivity issues occur, the instrument might have been contaminated, and a full cleaning might be necessary.

If a full cleaning, including advanced cleaning of the QJet ion guide, does not resolve issues, a service visit might be required.
Figure 2-1 Vacuum Interface Components

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Curtain plate</td>
</tr>
<tr>
<td>2</td>
<td>Orifice plate</td>
</tr>
<tr>
<td>3</td>
<td>QJet ion guide. 3200 and 4000 series systems have a skimmer instead.</td>
</tr>
<tr>
<td>4</td>
<td>O-ring</td>
</tr>
</tbody>
</table>

Symptoms of Contamination

These problems indicate that the system might be contaminated:
- Significant loss in sensitivity
- Increased background noise
- Additional peaks that are not part of the sample appear in full scan or survey scan methods

If you observe these problems, clean the mass spectrometer front end.
Chemical Precautions

WARNING! Toxic Chemical Hazard: Follow all safety guidelines when handling, storing, and disposing of chemicals.

WARNING! Radiation Hazard, Biohazard, or Toxic Chemical Hazard: Determine whether mass spectrometer decontamination is required prior to cleaning. Decontamination should be performed prior to cleaning if radioactive materials, biological agents, or toxic chemicals have been used with a mass spectrometer.

WARNING! Environmental Hazard: Do not dispose of system components in municipal waste. Follow established procedures when disposing of components.

• Determine which chemicals may have been used in the instrument prior to service. Refer to the Safety Data Sheets (SDSs) if you are not familiar with the chemicals and the health and safety precautions that should be followed.
• Work in a well-ventilated area.
• Always wear assigned personal protective equipment, including powder-free nitrile gloves, safety glasses, and a laboratory coat.
• Follow required electrical safe work practices.
• Avoid ignition sources when working with flammable materials, such as isopropanol, methanol, and other flammable solvents.
• Take care in the use and disposal of any chemicals. Potential risk of personal injury if proper procedures for handling and disposing of chemicals are not followed.
• Avoid skin contact with chemicals during cleaning, and wash hands after use.
• Comply with all local regulations for the handling of radioactive materials.

Best Practices

• Always wear clean, powder-free gloves for the cleaning procedures.
• After cleaning mass spectrometer components, and before reassembling them, put on a new, clean pair of gloves.
Introduction

- Do not use cleaning supplies other than those specified in this procedure.
- Use fresh, high-quality (pure) water (at least 18 MΩ de-ionized [DI] water or ultra-pure HPLC-grade water). Old water can contain contaminants that can further contaminate the mass spectrometer.
- If possible, prepare cleaning solutions just before you begin cleaning.
- Prepare and store all organic solutions and organic-containing solutions in very clean glassware only. Never use plastic bottles. Contaminants can leach from these bottles and further contaminate the mass spectrometer.
- Allow only the center area of the wipe to contact the mass spectrometer surface. Cut edges can leave fibers behind.

**Tip!** Wrap the wipe around a thermally-bonded polyester swab (poly swab).

**Figure 2-2 Example: Folding the Wipe**

- To avoid cross-contamination, discard the wipe or swab after it has touched the surface once.
- Larger parts of the vacuum interface, such as the curtain plate, might require several cleanings, using multiple wipes.
- To avoid contaminating the cleaning solution, pour the solution on the wipe or swab.
- Only dampen the wipe or swab slightly when applying water or cleaning solution. Water, more so than organic solvents, might cause the wipe to deteriorate, leaving residue on the mass spectrometer.
- Do not rub the wipe across the apertures, to prevent fibres from the wipes from entering the mass spectrometer. Wipe around the aperture.
- Do not insert the brush into the aperture on the curtain plate, orifice plate, skimmer, or IQ0 lens.

**Required Materials**

**Note:** U.S. customers can call 877-740-2129 for ordering information and inquiries. International customers can visit www.absciex.com/contact-us.

- Powder-free gloves (nitrile recommended)
- Safety glasses
- Laboratory coat
• Fresh, high-quality (pure) water (at least 18 MΩ de-ionized [DI] water or ultra-pure HPLC-grade water). Old water can contain contaminants that can further contaminate the mass spectrometer.
• MS-grade methanol, isopropanol (2-propanol), or acetonitrile
• Cleaning solution. Use one of:
  • 100% methanol
  • 100% isopropanol
  • 50:50 acetonitrile:water solution (freshly prepared)
  • 50:50 acetonitrile:water with 0.1% acetic acid solution (freshly prepared)
• Clean 1 L or 500 mL glass beaker to prepare cleaning solutions
• 1 L beaker to catch used solvent
• Organic waste container
• Lint-free wipes. Refer to Tools and Supplies Available from the Manufacturer on page 10.
• (Optional) Poly swabs

Full Cleaning
• For advanced cleaning of the QJet® ion guide:
  • (4500, 5500, 6500, and 5000 series systems) C-clip removal tool and 1.5 mm hex key
  • (TripleTOF® systems) Phillips screwdriver
  • Alconox. Refer to Tools and Supplies Available from the Manufacturer on page 10.
  • A separate supply of clean, dry air (CDA) or nitrogen

Q0 Cleaning
• Q0 cleaning tool. Refer to Tools and Supplies Available from the Manufacturer on page 10.
• A separate supply of CDA or nitrogen
Tools and Supplies Available from the Manufacturer

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleaning kit (3200, 4000, 4500, 5000, and 5500 series systems). Contains the small poly swab, lint-free wipes, Q0 cleaning tool, straight QJet® ion guide cleaning brush, and Alconox packets.</td>
<td>5020761</td>
</tr>
<tr>
<td>Cleaning kit (4600 and 5600 series systems). Contains the small poly swab, lint-free wipes, Q0 cleaning tool, tapered QJet ion guide cleaning brush, and Alconox packets.</td>
<td>5020763</td>
</tr>
<tr>
<td>Cleaning kit (6500 series systems). Contains the small poly swab, lint-free wipes, Q0 cleaning tool, tapered IonDrive™ QJet ion guide cleaning brush, Q0 cleaning brush, and Alconox packets.</td>
<td>5021294</td>
</tr>
</tbody>
</table>
Routine Cleaning

WARNING! Toxic Chemical Hazard: Follow all safety guidelines when handling, storing, and disposing of chemicals.

WARNING! Radiation Hazard, Biohazard, or Toxic Chemical Hazard: Determine whether mass spectrometer decontamination is required prior to cleaning. Decontamination should be performed prior to cleaning if radioactive materials, biological agents, or toxic chemicals have been used with a mass spectrometer.

WARNING! Environmental Hazard: Do not dispose of system components in municipal waste. Follow established procedures when disposing of components.

For routine cleaning, clean the curtain plate and the front of the orifice plate. Routine cleaning can be performed while the mass spectrometer remains under vacuum.

Routine cleaning includes these steps:

1. Prepare the Mass Spectrometer on page 11
2. Clean the Curtain Plate on page 12
3. Clean the Front of the Orifice Plate on page 13
4. Put the Mass Spectrometer Back into Service on page 14

Prepare the Mass Spectrometer

1. Deactivate the hardware profile. Refer to the System User Guide or the Analyst® Software Getting Started Guide.
WARNING! Hot Surface Hazard: Let the ion source cool for at least 90 minutes (for the IonDrive™ Turbo V ion source) or 30 minutes (for other ion sources) before starting any maintenance procedures. Surfaces of the ion source and its components become hot during operation.

2. Remove the ion source. Refer to the ion source Operator Guide.

When the ion source is not in use, store it, to protect it from damage, and to maintain operating integrity.

Caution: Potential System Damage: Do not drop anything into the source drain when the ion source is removed.

Figure 3-1 Source Drain on the Vacuum Interface

Clean the Curtain Plate

Caution: Potential System Damage: Do not rest the curtain plate or orifice plate on the aperture tip. Make sure that the conical side of the curtain plate faces up.

1. Remove the curtain plate and then place it, conical side up, on a clean, stable surface.
Figure 3-2 Curtain Plate Removal

Caution: Potential System Damage: Do not insert a wire or metal brush into the aperture on the curtain plate, orifice plate, interface heater, or IQ0 lens to avoid damaging the aperture.

2. Dampen a lint-free wipe with pure water and clean both sides of the curtain plate. Use multiple wipes, as required.
3. Repeat step 2 using the cleaning solution.
4. Using a dampened wipe or small poly swab, clean the aperture.
5. Wait until the curtain plate is dry.
6. Inspect the curtain plate for solvent stains or lint, removing any residue with a clean, slightly damp, lint-free wipe.

Note: Persistent spotting or filming is an indicator of contaminated solvent.

Clean the Front of the Orifice Plate

When cleaning the standard orifice plate with the removable interface heater, do not remove the interface heater. Surface cleaning of the interface heater is adequate for routine cleaning.

Caution: Potential System Damage: Do not insert a wire or metal brush into the aperture on the curtain plate, orifice plate, interface heater, or IQ0 lens to avoid damaging the aperture.
Routine Cleaning

1. Dampen a lint-free wipe with water and then wipe the front of the orifice plate, including the interface heater.
2. Repeat the previous step using the cleaning solution.
3. Wait until the orifice plate is dry.
4. Inspect the orifice plate for solvent stains or lint, removing any residue with a clean, slightly damp, lint-free wipe.

**Note:** Persistent spotting or filming is an indicator of contaminated solvent.

Put the Mass Spectrometer Back into Service

1. Install the curtain plate on the front end of the mass spectrometer.
2. Install the ion source on the mass spectrometer. Remember to tighten the source by turning the source latches down into the locking position. Refer to the ion source *Operator Guide*.
3. Activate the hardware profile. Refer to the *System User Guide* or the *Analyst® Software Getting Started Guide*.
Full Cleaning

**WARNING!** Toxic Chemical Hazard: Follow all safety guidelines when handling, storing, and disposing of chemicals.

**WARNING!** Radiation Hazard, Biohazard, or Toxic Chemical Hazard: Determine whether mass spectrometer decontamination is required prior to cleaning. Decontamination should be performed prior to cleaning if radioactive materials, biological agents, or toxic chemicals have been used with a mass spectrometer.

**WARNING!** Environmental Hazard: Do not dispose of system components in municipal waste. Follow established procedures when disposing of components.

If sensitivity loss or charging (a significant loss of sensitivity of the ions of interest over a short period of time) occur, then the curtain plate, orifice plate, and QJet® ion guide or skimmer must be cleaned.

Before cleaning these components, determine whether the contamination has extended to the Q0 region. Refer to *Verify Q0 Region Operation on page 16*. If it does, the Q0 region must also be cleaned.

**Note:** Do not clean the Q0 region unless there is evidence of contamination in this region.

For full cleaning, clean the curtain plate, orifice plate, and QJet ion guide or skimmer while the mass spectrometer is at atmospheric pressure (vented). Do these tasks in order:

1. *Prepare the Mass Spectrometer on page 16.*
2. *Clean the Curtain Plate and Orifice Plate on page 17.*
3. (QJet ion guide-equipped systems) *Clean the QJet® Ion Guide.*
4. (Skimmer-equipped systems) *Clean the Skimmer on page 22.*
5. *Put the Mass Spectrometer Back into Service on page 23.*
Verify Q0 Region Operation

- Switch polarity, scan for several minutes, and then return to the original polarity. For example, when running a positive mode experiment, switch to negative mode.

Table 4-1 Effects of Polarity Change on Sensitivity

<table>
<thead>
<tr>
<th>Result</th>
<th>Recommended Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity improves temporarily, and then begins to decline gradually. Q0 region contamination is suspected.</td>
<td>Clean the curtain plate, orifice plate, and QJet® ion guide or skimmer, and then clean the Q0 region. Refer to Q0 Cleaning (Optional) on page 25.</td>
</tr>
<tr>
<td>Sensitivity is the same after the polarity change. Q0 region contamination is not suspected.</td>
<td>Clean the curtain plate, orifice plate, and QJet ion guide or skimmer only.</td>
</tr>
</tbody>
</table>

Prepare the Mass Spectrometer

Caution: Potential System Contamination: Do not force venting. Doing so can cause contaminants to enter the mass spectrometer.

WARNING! Hot Surface Hazard: Let the ion source cool for at least 90 minutes (for the IonDrive™ Turbo V ion source) or 30 minutes (for other ion sources) before starting any maintenance procedures. Surfaces of the ion source and its components become hot during operation.

1. Shut down the system by following the procedure in the System User Guide or Hardware Guide. Wait at least 25 minutes for the mass spectrometer to vent naturally, and then disconnect the AC mains supply cables of the mass spectrometer and roughing pump from the AC mains supply.

2. Remove the ion source. Refer to the ion source Operator Guide. When the ion source is not in use, store it, to protect it from damage, and to maintain operating integrity.

Caution: Potential System Damage: Do not drop anything into the source drain when the ion source is removed.
Clean the Curtain Plate and Orifice Plate

**Caution: Potential System Damage:** Do not rest the curtain plate or orifice plate on the aperture tip. Make sure that the conical side of the curtain plate faces up.

1. Remove the curtain plate and then place it, conical side up, on a clean, stable surface.

   **Figure 4-1 Curtain Plate Removal**

   ![Curtain Plate Removal](image)

   **Caution: Potential System Damage:** Hold the orifice plate to prevent it from dropping when you release the spring latches.

2. While holding the orifice plate with one hand, use the other hand to release the spring latches and then remove the orifice plate and place it, conical side up, on a clean, stable surface.
3. Clean the curtain plate. Refer to *Clean the Curtain Plate on page 12*.
4. Using lint-free wipes and water, clean the inner metal portion on each side of the orifice plate.
5. Repeat the previous step using the cleaning solution.
6. Wait until the orifice plate is dry.
7. Inspect the orifice plate for solvent stains or lint, removing any residue with a clean, slightly damp, lint-free wipe.

**Note:** Persistent spotting or filming is an indicator of contaminated solvent.
Clean the QJet® Ion Guide

This procedure is applicable for 4500, 4600, 5000, 5500, 5600, and 6500 (IonDrive™ QJet ion guide) series systems.

Perform a basic cleaning regularly. If it does not resolve contamination problems, and a more rigorous cleaning is required, perform the advanced cleaning.

Perform a Basic Cleaning of the QJet® Ion Guide

Perform this procedure regularly to clean the QJet ion guide. If this procedure does not resolve contamination problems, refer to Perform an Advanced Cleaning of the QJet® Ion Guide.

1. Remove the QJet ion guide and place it on a clean, stable surface.
2. Remove the O-ring from the rear of the QJet ion guide.

3. Hold the QJet ion guide over a 500 mL beaker (or equivalent), with the IQ0 lens side down, and then pour pure water over and through it.
4. Invert the QJet ion guide, and repeat step 3.
5. Repeat step 3 and step 4.
6. Wait until the QJet ion guide is dry.
7. Inspect the QJet ion guide for solvent stains or lint, removing any residue with a clean, slightly damp, lint-free wipe.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IQ0 lens</td>
</tr>
<tr>
<td>2</td>
<td>O-ring</td>
</tr>
</tbody>
</table>
**Perform an Advanced Cleaning of the QJet® Ion Guide**

Perform this procedure when the basic cleaning does not resolve contamination problems.

**Prepare the Alconox Solution**

1. Empty an alconox packet into a clean, dry glass container, such as a one liter beaker.
2. Add 25 mL hot water (if possible, 42°C to 46°C), while stirring.

**Tip!** Tap water can be used. If the quality of the tap water is poor, use bottled water, heated separately.

3. Continue adding water, 25 mL at a time, until 100 mL have been added.
   
   The result should be a foamy, saturated solution. The alconox powder should be dissolved as much as possible. Latex gloves might turn slightly yellow from exposure to the soap and water.

**Clean the QJet® Ion Guide**

1. Prepare the Alconox mixture. Refer to **Prepare the Alconox Solution**.
2. Remove the QJet ion guide and place it on a clean, stable surface.
3. Remove the O-ring from the rear of the QJet ion guide.
4. Remove the IQ0 lens from the QJet ion guide:
   
   - (4500, 5000, 5500, and 6500 systems) Remove the two 1.5 mm hex screws that hold the lens on the QJet ion guide, and then remove the C-clip with the C-clip removal tool.
   
   - (TripleTOF® systems) Remove the three Phillips screws that hold the lens on the QJet ion guide.
5. Pour hot tap water over and through the QJet ion guide to rinse it.
6. Immerse the brush in the alconox solution.
Caution: Potential System Damage: Avoid contact between the metal handle of the brush and the rods, and do not bend the brush handle.

7. Insert the brush into the center of the QJet ion guide, applying a liberal amount of the foamy alconox solution.
8. Scrub for one minute.

**Note:** Do not immerse the QJet ion guide in the alconox solution, to avoid contaminating the solution.

9. Repeat step 6 to step 8 until the entire surface has been cleaned.
10. Brush across the non-metal parts of the QJet ion guide.
11. Pour hot tap water over and through the QJet ion guide for one minute, while brushing with the soapy brush.
12. Pour hot tap water over and through the QJet ion guide for three minutes, while rinsing any soap from the gloves.
13. Make sure all residue has been rinsed away.
14. Watch for evidence of water beading on the surface to confirm that the QJet ion guide is clean.
15. Pour pure water over and through the QJet ion guide for one minute.

**WARNING!** Toxic Chemical Hazard: Use a fume hood when pouring solvents or evaporating solvents. Make sure that adequate ventilation is available. Wear appropriate personal protective equipment. For health and safety precautions, refer to the System User Guide or the Safety Practices Guide.

16. Under a fume hood, pour 100 mL to 200 mL of isopropanol or methanol onto the QJet ion guide, making sure that it is applied to the entire surface. Catch any waste and discard it in the designated waste container. Isopropanol and methanol facilitate drying.

**WARNING!** Compressed Gas Hazard: Make sure that the gas pressure does not exceed 60 psi. Make sure that the gas stream is not directed toward the operator.

17. Use clean dry air (CDA) or nitrogen to dry the QJet ion guide. Be sure to remove all droplets.

**Note:** Gas generators do not have sufficient flow to displace any remaining droplets.

18. Wipe off any remaining spots with a lint-free wipe dampened with isopropanol or methanol.
Caution: Potential System Damage: Do not insert a wire or metal brush into the aperture on the curtain plate, orifice plate, interface heater, or IQ0 lens to avoid damaging the aperture.

19. Repeat step 10 to step 18 to clean the IQ0 lens.
20. Clean the O-ring by pulling it gently through a lint-free wipe slightly dampened with methanol or isopropanol.
21. Install the O-ring and IQ0 lens on the QJet ion guide.

Clean the Skimmer

This procedure is applicable to 3200 and 4000 series systems.

1. Remove the skimmer and place it on a clean, stable surface.

2. Using fingers only, carefully remove the O-ring from the rear of the skimmer.

Note: The skimmer has only one O-ring, located at the rear.
3. Using lint-free wipes and water, clean both sides of the skimmer.
4. Repeat step 3 using the cleaning solution.
5. Inspect the skimmer for solvent stains or film, removing any residue with a clean, slightly damp lint-free wipe.

**Note:** Persistent spotting or filming is an indicator of contaminated solvent.

6. Clean the O-ring by pulling it gently through a lint-free wipe slightly dampened with methanol or isopropanol.
7. Reinstall the O-ring on the skimmer.

### Put the Mass Spectrometer Back into Service

1. *(QJet® ion guide-equipped systems)* Install the QJet ion guide.

   **Note:** If the ion guide is properly seated, it will pop out slightly when released. If it is not properly seated, pull it out slightly, turn it, and then try again.

   **Tip!** Use the correct orifice plate for the system for optimal performance. Do not use an orifice plate for another system. The model number for the system is etched on the orifice plate.

2. *(Skimmer-equipped systems)* Install the skimmer.
   a. Align the pin on the back of the skimmer with one of the three notches in the assembly.
   b. Push the skimmer into place.
Full Cleaning

Figure 4-7 The Pin on the Skimmer and the Notches on the Mass Spectrometer

Tip! Use the correct orifice plate for the system for optimal performance. Do not use an orifice plate for another system. The model number for the system is etched on the orifice plate.

3. Install the orifice plate.
   a. Align the pins on the orifice plate with the corresponding holes in the mass spectrometer.
   b. Insert the orifice plate, pushing it into place until two clicks are heard.

Figure 4-8 Pins on the Orifice Plate and Holes in the Mass Spectrometer

4. Install the curtain plate.
5. Install the ion source. Refer to the ion source Operator Guide.
6. Start up the mass spectrometer. Refer to the System User Guide or Hardware Guide.
Q0 Cleaning (Optional)

WARNING! Toxic Chemical Hazard: Follow all safety guidelines when handling, storing, and disposing of chemicals.

WARNING! Radiation Hazard, Biohazard, or Toxic Chemical Hazard: Determine whether mass spectrometer decontamination is required prior to cleaning. Decontamination should be performed prior to cleaning if radioactive materials, biological agents, or toxic chemicals have been used with a mass spectrometer.

WARNING! Environmental Hazard: Do not dispose of system components in municipal waste. Follow established procedures when disposing of components.

Tip! Clean the Q0 region regularly to minimize the impact of charging (a significant loss of sensitivity of the ions of interest over a short period of time) on the quadrupoles.

If the Q0 region is contaminated, it can be cleaned. The mass spectrometer must be at atmospheric pressure and the other front-end components must be removed.

Note: To determine whether the region is contaminated, perform the Q0 test. Refer to Verify Q0 Region Operation on page 16.

Do these tasks in order:
1. Prepare the Mass Spectrometer on page 26
2. Prepare the Q0 Cleaning Tool on page 26
3. Clean the Tip of the Rods on page 29
4. Clean Beyond the Tip Area on page 30
5. Put the Mass Spectrometer Back into Service on page 23
Prepare the Mass Spectrometer

**Caution: Potential System Contamination: Do not force venting. Doing so can cause contaminants to enter the mass spectrometer.**

1. Shut down the system by following the procedure in the *System User Guide* or *Hardware Guide*. Wait at least 25 minutes for the mass spectrometer to vent naturally, and then disconnect the AC mains supply cables of the mass spectrometer and roughing pump from the AC mains supply outlet.

**WARNING! Hot Surface Hazard: Let the ion source cool for at least 90 minutes (for the IonDrive™ Turbo V ion source) or 30 minutes (for other ion sources) before starting any maintenance procedures. Surfaces of the ion source and its components become hot during operation.**

2. Remove the ion source. Refer to the ion source *Operator Guide*. When the ion source is not in use, store it, to protect it from damage, and to maintain operating integrity.

**Caution: Potential System Damage: Do not rest the curtain plate or orifice plate on the aperture tip. Make sure that the conical side of the curtain plate faces up.**

3. Remove the curtain plate, orifice plate, and QJet® ion guide or skimmer, and then place them on a clean, stable surface. Make sure that the conical side of the curtain plate and orifice plate is facing upwards.

### Prepare the Q0 Cleaning Tool

**Note:** Clean Q0 in two steps, to avoid pushing contaminants onto the IQ1 lens, or through to the other side.

1. Dampen a wipe in methanol and then clean the outside surface of the Q0 cleaning tool.
Figure 5-1 Q0 Cleaning Tool

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bottom eyelet</td>
</tr>
<tr>
<td>2</td>
<td>Top eyelet</td>
</tr>
</tbody>
</table>

2. Let the Q0 cleaning tool dry.

Caution: Potential System Damage: Prepare the wipe properly, to make sure that it is held securely in the eyelet of the cleaning tool, and to prevent it from falling off during use.

3. (QJet® ion guide-equipped systems) Follow these steps to prepare the tool:
   a. Cut a wipe in half on the fold.
   b. Fold the wipe so the cut edge is on the inside. The resulting folded wipe should be about 5.7 cm (2.25 inches) long.
   c. Insert the wipe into the top eyelet.
Figure 5-2 Preparing the Q0 Cleaning Tool (QJet Ion Guide-Equipped Systems)

Caution: Potential System Damage: When using water, do not dampen the wipes excessively. Excessive moisture can cause the wipes to fall apart in the chamber.

4. (Skimmer-equipped systems) Follow these steps to prepare the tool:
   a. Roll the wipe around the Q0 cleaning tool.
   b. Flatten the wipe and insert it into the eyelet.
      The wipe should be 1 cm (3/8 in.) wide.
Tip! If the wipe is too wide to fit into the eyelet easily, roll it on a clean, slightly-smaller diameter tool, such as the handle of a poly swab.

Figure 5-3 Preparing the Q0 Cleaning Tool (Skimmer-Equipped Systems)

Caution: Potential System Damage: When using water, do not dampen the wipes excessively. Excessive moisture can cause the wipes to fall apart in the chamber.

5. Dampen the wipe slightly with cleaning solution.
6. Blot the wipe with a dry wipe to remove excess moisture.
7. Flatten the wipes for easy insertion into Q0.

Clean the Tip of the Rods

Caution: Potential System Damage: Do not force the rods apart during cleaning.

1. Insert the Q0 cleaning tool approximately 2.5 cm (1 inch) deep between the Q0 rods.
Q0 Cleaning (Optional)

2. Turn the Q0 cleaning tool two full revolutions clockwise. This prevents the wipe from becoming too thickly wound in one spot, which would make the tool difficult to remove.

3. Slowly pull the tool out of the Q0 rod set. Do not push the tool further into the Q0 rod set.

4. Remove the contaminated wipe from the Q0 cleaning tool, and dispose of it according to standard laboratory operating procedures.

5. Insert a clean wipe, dampened with methanol.

6. Repeat step 1 through step 4 at least one more time.

**Note:** If severe contamination is suspected, additional cleaning might be required.

7. Remove and dispose of the contaminated wipe.

**Clean Beyond the Tip Area**

**Caution:** Potential System Damage: Do not force the Q0 cleaning tool past the shield in the Q0 rod set, to avoid striking the IQ1 lens. Resistance will be felt when the tool encounters the shield.

1. Insert a clean wipe, dampened with cleaning solution.

2. Install the Q0 cleaning tool between the Q0 rods until resistance is felt when it contacts the shield.

3. Slowly turn the Q0 cleaning tool while pulling it forward, out of the mass spectrometer. This prevents the wipe from becoming too thickly wound in one spot, which would make the tool difficult to remove.

4. Remove the contaminated wipe from the Q0 cleaning tool, and dispose of it according to standard laboratory operating procedures.

5. Insert a clean wipe, dampened with methanol.

6. Repeat step 2 to step 4.

7. Wait until the Q0 region is dry.

8. (Optional) Dry the Q0 region, while it is still wet, with a flow of clean air or nitrogen.

Continue with *Put the Mass Spectrometer Back into Service on page 23.*
Routine Cleaning
Quick Reference

For step-by-step instructions and safety warnings, refer to the procedure in this guide.

**Personal Protective Equipment**

**Supplies**

- water (H₂O)
- cleaning solution (CS*)

PN WC018027

* Cleaning Solution (CS). Use one of:
  - 100% methanol
  - 100% IPA
  - 50:50 ACN:H₂O
  - 50:50 ACN:H₂O + 0.1% acetic acid

All solutions must be MS-grade.

Refer to SDS

For step-by-step instructions and safety warnings, refer to the procedure in this guide.

30 minutes

00:20:00

PN WC018027
Full Cleaning Quick Reference (QJet® Ion Guide - Equipped Systems)

For step-by-step instructions and safety warnings, refer to the procedure in this guide.

- **Personal Protective Equipment**
- **Other instruments**

**Supplies**
- H₂O
- CS*
- Methanol

* Cleaning Solution (CS). Use one of:
  - 100% methanol
  - 100% IPA
  - 50:50 ACN:H₂O
  - 50:50 ACN:H₂O + 0.1% acetic acid

All solutions must be MS-grade.

Refer to SDS for step-by-step instructions and safety warnings.
Full Cleaning Quick Reference
(Skimmer-Equipped Systems)

For step-by-step instructions and safety warnings, refer to the procedure in this guide.

Personal Protective Equipment

Supplies

H₂O CS* wipe PN WC018027

* Cleaning Solution (CS). Use one of:
  - 100% methanol
  - 100% IPA
  - 50:50 ACN:H₂O
  - 50:50 ACN:H₂O + 0.1% acetic acid

All solutions must be MS-grade.

Refer to SDS

Hardware Configuration Editor

Hardware Profiles:
- SKIMMER PUMP

[Checkmark symbol]

[Deactivate Profile]
Q0 Region Cleaning
Quick Reference

Note: Before cleaning Q0, perform a full cleaning.

For step-by-step instructions and safety warnings, refer to the procedure in this guide.

Personal Protective Equipment

Supplies

* Cleaning Solution (CS). Use one of:
  - 100% methanol
  - 100% IPA
  - 50:50 ACN:H₂O
  - 50:50 ACN:H₂O + 0.1% acetic acid

All solutions must be MS-grade.

Refer to SDS