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Troubleshooting and Correcting Dripping from an Autosampler Probe

Service Bulletin

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Introduction

When the sample probe is withdrawn from a vial, liquid should not stick to the probe.

Under certain conditions, droplets of liquid may cling to the probe and drip off into other sample or standards vials.

The most frequent cause of dripping is contamination of the sample probe. Contamination can come from handling the probe, from samples, or migration of plasticizers or other contaminants into the rinse solution. Whatever the source of contamination, dripping can be mitigated by thorough cleaning of the probe and rinse station.

This bulletin also discusses some other ways to reduce problems with dripping.

WARNING

CHEMICAL BURN HAZARD

Be sure to wear protective eyewear and safety gloves when handling chemicals.

Before You Begin

You will need the following supplies:

- Nitric acid (10% and 1-2%)
- 10% NaOH (optional)
- KIMTECH SCIENCE™ KIMWIPES® Delicate Task Wipers
- Deionized water
- Chromatography grade isopropanol or n-propanol
- New rinse tubing
- New peristaltic pump tubing
- Ultrasonic cleaner
- Clean laboratory gloves

NOTE

Be sure to use chromatography grade solvent when cleaning the rinse station. Lower grade solvents may leave an organic residue and re-contaminate the rinse station.

Cleaning the Sample Probe

- 1 Moisten a Kimwipes® wiper with 10% HNO₃ and wipe the probe to remove any aqueous or inorganic contamination from the surface. Rinse with DI water.
- 2 (Optional) Soak the probe in 10% NaOH for 20 minutes, then rinse with DI water.
- 3 Then moisten a new Kimwipes wiper with a chromatography grade solvent such as n-propanol, isopropanol, or hexane. Firmly squeeze the probe with the wiper as you wipe the probe again to remove any oil.
- 4 Let the probe air dry.
- 5 Reinstall using gloves to avoid contamination from fingers.

Cleaning the Rinse Station

- 1 Disconnect the rinse station from the autosampler and tubing.
- 2 Submerge the rinse station in 1 – 2% nitric acid in DI water and sonicate for 10 minutes.
- 3 Rinse clean with DI water.
- 4 Rinse all inside surfaces with a chromatography grade solvent such as isopropanol, acetone, or n-propanol.
- 5 Allow the rinse station to air dry or blow dry with argon.
- 6 Rinse again with DI water.
- 7 Re-install the rinse station.
- 8 Replace all rinse tubing, including the peristaltic pump tubing, with new tubing.

NOTE

To prevent dripping from reoccurring, you must use tubing with a new formulation which is available from Teledyne CETAC Technologies. Look up the part number for Chemical Resistant Tygon 2375 in the spare parts catalog for the ASX-560, ASX-280, or XLR-860 autosamplers

General Tips to Prevent Contamination and Dripping

- **Wear gloves.** Be careful not to touch the probe without gloves—residue from handling the probe can cause the surface tension properties of the probe surface to change and can lead to material dripping off the probe during use. Periodic cleaning may be necessary depending on the application.
- **Use only the recommended cleaning solutions.** Avoid using detergents and surfactants such as TRITON X-100 to clean the probe or rinse station. These materials can make the droplets larger on the surface of the probe and more likely to fall off.
- **Clean everything.** Clean the sample probe, clean the rinse station, and replace tubing before running the autosampler. Using the autosampler before all of the steps are completed can result in recontamination of the clean components.

Other Causes of Dripping

Cause	Solution
Contamination introduced by phthalate-free Tygon tubing exposed to acidic solutions	Use the Chemical Resistant Tygon tubing kit which is listed in the ASX-280, ASX-560, and XLR-860 spare part catalogs.
Contamination introduced by peristaltic pump tubing	Use another type of tubing (CETAC recommends PharMed® tubing for most applications) or tubing from a different vendor.
Dust contamination	Use an autosampler enclosure (enclosures with HEPA air filters are available from Teledyne CETAC Technologies).
Damage to sample probe resulting in rough surfaces	Replace the sample probe. Re-align if necessary to avoid scratching the probe surface.
Contamination from handling the sample probe	Clean the probe. Always wear clean gloves when handling the probe.
Sample probe material not compatible with sample matrix	See the <i>Accessories and Supplies Catalog</i> for your autosampler for a list of other sample probe materials.
Tubing material not compatible with solvent	Choose a compatible tubing material. PharMed tubing is preferable for aqueous applications.
Contaminated rinse solution	Change rinse solution more frequently. Discharge used rinse solution into a waste container, rather than recycling it.
Sample probe moving too fast	Use the SpeedShift software (ASX-520 family) or ASX Dashboard software (ASX-560 family) to reduce the motion speed of the autosampler.
Liquid falling from inside the probe	Check for leaks in tubing connections. Increase the pump speed or vacuum power in any valve-switching sample introduction system (such as the ASXPRESS® PLUS) to help pull liquid up through the probe.
Dripping and contamination from the probe guide	The probe guide plate can be removed from the Z-drive assembly when using a rigid carbon fiber probe.
Oily or sludgy water samples <i>Particularly oily or sludgy water samples can be problematic, even with the correct rinse tubing and cleaning procedure.</i>	Use the drip-resistant probe design which is listed in the ASX-280, ASX-560, and XLR-860 spare parts catalogs.
Particularly difficult rinse/drain solutions <i>Certain rinse/drain solutions can be problematic to any Tygon formulation.</i>	Certain rinse/drain solutions can be problematic to any Tygon formulation. Use the FEP-lined Tygon tubing kit which is listed in the ASX-280, ASX-560, and XLR-860 spare parts catalogs.

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