# Proper Column Care and Storage

All chromatographic columns have a finite lifetime. It is good practice to routinely monitor each column's retention characteristics and performance using appropriate analyte standards. If the column is to be stored for more than two weeks, it is necessary to use a mobile phase which will inhibit microbial growth. Solvent mobile phases containing sodium azide or high concentrations of methanol or acetonitrile are suggested.

The following precautions should be taken with Hamilton HPLC columns to achieve maximum product life:

1. Routinely monitor the column's performance.
2. Switch only between mutually miscible mobile phases.
3. Avoid the possibility of precipitation of salts in the column.
4. Use only filtered and degassed mobile phases.
5. Do not allow the column to dry out.
6. Keep the column capped with the end plugs that came with the column when not in use.
7. For prolonged storage, use a mobile phase that will inhibit bacterial and mold growth.
8. Unusually high operating pressure is an indication of a plugged inlet frit. It may be cleared by reversing flow through the column for 5–10 column volumes.
9. Using guard columns is highly recommended to remove particulate matter or impurities which may permanently bind to the polymer packing materials inside the analytical column.

**Technique Tip**

When executing a wash procedure, use an appropriate flow rate based on the column's inside diameter.

*Custom HPLC columns are available! From dimensions to particle size to packing materials, Hamilton can build you exactly what you need. See page 48 for more information.*




## Restoring column performance

Contamination of the stationary phase from samples or eluents can cause the column performance to diminish over time. Typically, one of the following procedures will rejuvenate the performance of a column that has deteriorated.

### Column Restoration Procedures

| PRP-1, PRP-C18, PRP-3, PRP-h5 | PRP-X100 | PRP-X200, PRP-X300 | PRP-X400 | RCX-10 | RCX-30 |
|---|---|---|---|---|---|
| Flush with 40:40:20 (ACN:IPA:$H_2O$) | Flush 50 mL of methanol with 1% 6 N nitric acid | Inject several times with 100 µL of 1 N nitric acid | Inject several times with 100 µL of 0.1 M potassium EDTA | Flush with 50 mL of 0.1 N sodium hydroxide | Flush with 150 mL of 0.1 N sodium hydroxide |

### Column Restoration Procedures

| HC-75 | | | HC-40 |
|---|---|---|---|
| **Calcium Form** | **Hydrogen Form** | **Lead Form** | **Calcium Form** |
| Flush with 1% calcium chloride at 0.1 mL/min overnight | Flush with 0.1 N sulfuric acid at 0.1 mL/min overnight | Flush with 1% lead nitrate at 0.1 mL/min overnight | Flush with 1% calcium chloride at 0.1 mL/min overnight |

Reverse the column so that the flow is now entering in through what was the outlet fitting, and do not connect the outlet fitting to the detector.

**Technique Tip**

Always make sure that the mobile phases are miscible and that precipitation will not occur. If necessary wash the column with a suitable intermediate solvent before changing over to the new phase. A minimum of five column volumes of the intermediate solvent should be used.

# Chromatography Syringes

Hamilton offers the most complete selection of syringes on the market for use in various applications including gas chromatography (GC) and high performance liquid chromatography (HPLC) and thin layer chromatography (TLC). Building exceptional syringes is an evolving science, which is why Hamilton is dedicated to the continuous research and development of this product line.

### HPLC and GC Autosampler Syringes

Hamilton offers a line of syringes designed to work with a wide range of the most popular autosamplers from Agilent, CTC PAL®, Spark Holland and more. Each syringe is expertly handcrafted to maximize sample integrity, process efficiency and new long-life syringe technology.

### Manual HPLC Syringes

Hamilton provides a variety of custom needle syringes that are designed for use with manual HPLC injection ports. These syringes feature an electro-polished needle that slides smoothly into the injection port, minimizing the wear on valuable seals and rotors.

### TLC Syringes

The last 19 mm (0.75 in.) toward the tip of the needle on TLC syringes is coated with PTFE. The treatment reduces the surface tension between the needle and the liquid making it ideal for reproducible sample spotting.

For more information about the Hamilton line of chromatography syringes, please visit www.hamiltoncompany.com/syringes.


# About Hamilton Company

Hamilton Company is a global enterprise with headquarters in Reno, Nevada; Franklin, Massachusetts; and Bonaduz, Switzerland and subsidiary offices throughout the world.

We are an industry leader in the design and manufacture of liquid handling, process analytics, robotics and automated storage solutions. For more than 60 years, Hamilton has been satisfying customer needs by combining quality materials with skilled workmanship to ensure the highest level of performance. Hamilton's lifelong commitment to precision and quality has earned us global ISO 9001 Certification.


Founded on the technology of analytical Microliter™ and Gastight® syringes, Hamilton has a broad offering of laboratory products including manual and semi-automated precision fluid measuring instruments, chromatography products, process sensors, laboratory electrodes, pipettes and more. Top innovations from these lines include Arc™ pH, DO and conductivity intelligent sensors, the BioLevitator™ 3D Cell Culture System, Microlab® 600 Diluters/Dispensers and the Microlab 300 Guided Pipetting System.

A pioneer in liquid handling equipment and laboratory automation technology, Hamilton Robotics is known for advancing life science and biotechnology industries through reliability, performance and flexibility. Hamilton is the industry leader in design and manufacturing with patented technologies such as Compression-induced O-Ring Expansion (CO-RE™), Total Aspiration and Dispensing Monitoring (TADM) and Anti-Droplet Control (ADC). Hamilton's platforms include Hamilton VANTAGE™, its newest vertically-integrated liquid handler, Microlab STAR, Hamilton's highest selling automated pipetting platform, and Microlab NIMBUS®, the first in its class of compact, high-speed, personalized pipetting workstations.



Hamilton Storage Technologies offers comprehensive ultra-low temperature automated sample management systems for microtube and microplate storage. Hamilton's line of biobanking and compound storage solutions, as well as consumables, are designed for a broad array of life science processes. Products include BiOS™, SAM™ and ASM™, designed for sample integrity, flexibility and reliability.

Hamilton Company is focused on blending invention and accuracy to deliver customers unparalleled products.