Application Information:
Effective Cleaning of Pipettes

Chemical, water or other analysis requiring exact measurement and dispensing of liquid reagents relies on the use of pipettes. Some pipettes are disposable, however, reusable glass pipettes are preferred because they are typically of higher quality and are calibrated more exactly. The main disadvantage of using glass pipettes is the difficulty of cleaning them between users.

Some pipette cleaners are simple plastic jugs that fill and siphon water several times. Cleaning is accomplished by means of soaking and flushing. After this process, pipettes are typically placed in an oven for drying. This process can take hours and requires handling of wet pipettes. As a result, the tips are easily broken, rendering the pipettes useless. Another cleaning method is to use a laboratory glassware washer. Miele lab glassware washers equipped with pipette injector baskets and specified cleaning agents are ideally suited for the task and provide repeatable and analytically clean results.

Direct Injection Baskets
When cleaning pipettes, Miele injection baskets provide remarkably clean results for hard-to-reach interiors. Each pipette is placed tip down in a protective plastic holder, where water and detergent are injected providing thorough cleaning. A heated DI rinse follows to ensure complete removal of trace residues. If HEPA-filtered drying is used, forced hot air will circulate through the pipettes, providing complete drying.

A variety of injector baskets are offered including the E 404 full injector basket which is designed to hold up to 36 pipettes in a three row configuration. Row 1 can accommodate ten 100 ml pipettes (up to 550 mm in length), row 2 can hold fourteen 25 ml pipettes and row 3 can accommodate fourteen 10 ml pipettes. The E 405 basket offers the same capacity along with a drying connection for use in Miele washers with HEPA-filtered forced air drying.

The E 406 pipette basket is ideal for higher throughput. This basket holds 116 pipettes up to 45 mm in length. If the washer has HEPA-filtered forced air drying the E 408 (which holds up to 96 pipettes) should be used.

Temperature:
In general hotter water provides better cleaning and rinsing. For this reason, Miele's washers can heat water and DI water up to 93 C. Additionally wash and DI water temperatures are independently adjustable for maximum flexibility.

Mechanical Action:
It is often assumed that high pressure must be used to provide good cleaning results. The problem is, higher pressure also means greater chance of breaking delicate glassware. Miele's high turnover rate (circulation) of water at a low discharge pressure provides the best results without risk of glassware breakage.

How often the water and detergent contact the surface to be cleaned is actually more important than spray pressure. Miele lab washers circulate 106 or 156 gallons of water per minute compared with 25 gpm for typical household dishwashers and 60 gpm for typical lab washers. Miele's high circulation rate ensures analytically clean results, reduces the wash time required, aids in energy efficiency and allows for lower detergent usage.

Additionally, the Miele lower spray arm features special spray nozzles which angle and feather the jet spray for maximum coverage and impingement. Most other washer manufacturers simply provide drill holes in the spray arm which do not direct the water in this way.

Time:
Increasing the time of a wash cycle will improve the cleaning results. Yet most labs cannot afford to spend time waiting for a washer to complete long cycles. In addition to high circulation rates providing faster cleaning, Miele undercounter systems utilize only 2.5 gallons of water per fill which is heated by 6000 watts of power at 220 V. This means less time is wasted waiting for water to be heated up to temperature.

Detergent:
Selecting the proper detergent is an important step in achieving critically clean glassware. Miele offers an extensive line of powder and liquid detergents, and acid neutralizers for removal of virtually any residue from glassware. Miele provides detergent and neutralizer recommendations with every washer.

Conclusion
All Miele laboratory glassware washers can be utilized for effective cleaning of pipettes if equipped with the appropriate direct injection baskets.

For further information contact Miele @ 1-800-843-7231 and proinfo@mieleusa.com