Syringe Basics

Syringe Handling

When using a syringe, grasp only the syringe flange and plunger button. By doing so, variations in liquid measurement due to body heat are avoided. Pump the plunger with the syringe needle immersed in the fluid to be transferred. This will expel any trapped air in the needle and syringe. Avoid using a plunger in a dry syringe barrel.

If the plunger is accidentally removed from the syringe barrel, wipe it carefully with a lint-free tissue. Reinsert the plunger into the barrel and pump deionized water or acetone through the needle and syringe. In the case of gas-tight plungers, re-wet the PTFE plunger tip prior to reinserting it into the barrel. Avoid touching the plunger because any abrasions, scratches, or oil from fingers will often interfere with proper plunger operation.

Syringe Cleaning

The life of the syringe is directly related to its cleanliness. To clean syringes, it is best to use solvents known to be effective in solvating the sample—preferably those that are non-alkaline, non-phosphate, and non-detergent based. High-quality water and good-grade acetone prove to be good rinses. To clean the plunger, remove it from the syringe barrel and gently wipe it with a lint-free tissue. Reinsert the plunger into the barrel and pump deionized water or acetone through the needle and syringe. Air dry the syringe for storage. When reinserting a PTFE-tipped plunger into a syringe barrel, lubricate the tip by wetting it with deionized water or another solvent compatible with the sample.

Guide to Needle Termination Codes

Hamilton	SGE
(N) Cemented Needle (RN) Removable Needle (ASN) Autosampler Cemented Needle (ASRN) Autosampler Removable Needle (TLL) PTFE Luer Lock (KH) Knurled Hub (LT) Luer Tip (LTN) Luer Tip Cemented Needle	(F) Fixed Needle (R) Removable Needle (LL) Luer Lock (LT) Luer Tip

Needle Gauge Chart

Different size gauges are available for syringe needles. Restek offers a variety of gauges including 22, 22s, 23, 23s, 25, 26, 26s and the 23s—26s style. The small "s" (23s) after the gauge size specifies a small internal volume in the needle. For instance, a 26-gauge needle might have an internal volume of 1.25µL, when a 26s-gauge needle has a 0.26µL volume. The 26s-gauge needle has a much thicker side wall than the 26-gauge, which is more beneficial when using the syringe in an autosampler.

Gauge	Nominal OD	Nominal ID
26s	0.019 in. / 0.47mm	0.0050 in. / 0.13mm
26	0.018 in. / 0.46mm	0.0102 in. / 0.26mm
25	0.021 in. / 0.51mm	0.0102 in. / 0.26mm

23s	0.025 in. / 0.64mm	0.0060 in. / 0.15mm
23	0.025 in. / 0.64mm	0.0132 in. / 0.34mm
22s	0.028 in. / 0.72mm	0.0060 in. / 0.15mm
22	0.028 in. / 0.72mm	0.0162 in. / 0.41mm

Needle Point Style

Restek offers several different point styles on syringe and needle products. Choose one based on your application.

Point Style 2, BV: beveled needle tip. Recommended for optimum septum penetration and prevention of septum coring.

Point Style 3, LC: square/blunt needle tip. For use with HPLC injection valves and for sample pipetting.

Point Style 5, S/Hole, Bevel: conical needle with side hole. Liquid samples are filled and dispensed through the side hole.

Point Style H, Dome: domed needle tip with side hole. Liquid samples are filled and dispensed through the side hole. The solid tip minimizes septum damage.

Point Style Agilent, Cone, AS: special conical style needle point used exclusively on syringes for autosamplers. A cross-reference for Agilent syringes can be found here.

Syringe Termination

From cemented to removable needles and from PTFE luer-lock to special syringe fittings, syringe barrel terminations create the interface between a syringe and its mating connection. For your reference, we describe the most common Hamilton/SGE terminations below.

N, Cemented Needle / F, Fixed:

Needle cemented into the glass syringe barrel at a point corresponding to the zero graduation mark. Not autoclavable.

KH, Knurled Hub / R, Removable:

Used on 7000 Series Hamilton syringes, exclusively. Knurled hub enables 6000 psig maximum injection pressures and the attachment of a spacer for repeatable-depth injections. Autoclavable when disassembled.

RN, Removable Needle / R, Removable:
Needle seats precisely to the zero graduation mark of the syringe. Allows the use of different specification needles on the same syringe barrel. Autoclavable when disassembled.

TLL, PTFE Luer Lock / LL, Luer Lock / LT, Luer Tip:
Male luer taper with nickel-plated brass hub accepts and locks into place luer hub needles and connectors. Autoclavable when disassembled.