

Be a Syringe Expert!



SYRINGE SELECTION WITH CONSIDERATION TO SAMPLE SIZE

For the best possible injection reproducibility and accuracy, the smallest injectable volume from any syringe should be no less than 10 % of its total capacity, (for example: the smallest recommended injection volume from a 10 μL syringe would be 1 μL).

To accurately dispense 1 μL or less a NanoVolume syringe is recommended. SGE NanoVolume syringes are available with capacities ranging from 0.5 μL to 5 μL . These syringes can inject a volume as small as 0.05 μL because the entire sample is contained within the needle.

ADEQUATE WASHING AND FLUSHING OF A SYRINGE

A syringe should be flushed with approximately 5-10 times its total capacity to eliminate carryover between samples. This is achieved by repeatedly drawing and expelling solvent/sample from the syringe. To avoid contaminating the sample, the first 2-3 washes should be discarded to waste.

ELIMINATING AIR FROM A SYRINGE AND NEEDLE

Small air bubbles can be removed by repeatedly drawing and expelling sample while keeping the needle tip immersed in the solution.

Bubbles can also be removed by turning the syringe barrel upright and expelling some of the sample.

If bubbles persist, slow the aspiration speed.

TECHNIQUES FOR ACCURATE AND REPRODUCIBLE INJECTION

To make an injection, overfill the syringe then hold it vertically at eye level and press the plunger until the desired injection volume is reached. Draw the plunger back slightly and then wipe the needle tip with a lint free tissue making sure that the sample is not drawn from the needle. Make the injection.

For improved precision, syringes may be fitted with the SGE Repeating Adaptor RAX (Part Number 031930), which allows the volume to be preset on the syringe.

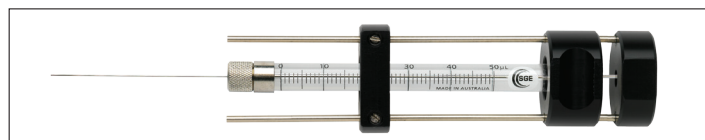


Figure 1. SGE Repeating Adaptor RAX

TEMPERATURE CONSIDERATIONS

- Fixed needle and Fixed Luer Lock syringes can be heated in an oven to 70 $^{\circ}\text{C}$.
- Removable needle and Removable Luer Lock syringes can be heated in an oven to 120 $^{\circ}\text{C}$.
- NanoVolume syringes can be heated in an oven to 70 $^{\circ}\text{C}$.

Rapid changes in temperature can lead to splitting of the glass barrel. Ensure heating and cooling of a syringe is a gradual process. Plungers should be removed for autoclaving procedures.

REGULAR INSPECTION OF SYRINGES

Syringes should be routinely checked for damage to the barrel and needle.

- Look for hairline cracks in the barrel.
- Needles should also be checked for burrs and rough surfaces which may cause tearing and excessive wear of the septum.

SYRINGE CLEANING

- Syringe cleaning agents will usually depend on the contaminating material. Methanol, methylene chloride, acetonitrile or acetone are commonly used.
- Do not immerse the entire syringe in solvent – this may damage the adhesive used to bond parts of the syringe.
- Clean externally by wiping with a tissue.
- After use always thoroughly rinse the syringe with solvent
- Before storage ensure that the syringe is dry.



Figure 2. Do not immerse syringe in solvent

Syringe Cleaning Steps:

1. Rinse thoroughly with suitable solvent.
2. Rinse with distilled water.
3. Flush with acetone.
4. Remove plunger and wipe with lint-free tissue.
5. Refit plunger and flush with acetone.
6. Allow syringe to dry.

PLUNGER CARE

Metal Plungers for Standard Syringes

- Never force the plunger.
- Replacement plungers for standard syringes are not available. Plungers are individually fitted to the barrels to achieve a perfect seal, therefore these plungers are not interchangeable.
- A perfectly sealing plunger may appear to be loose in the barrel.
- If the plunger action in the barrel starts to bind, follow the cleaning procedure outlined under "Syringe Cleaning".
- Avoid unnecessary movement of the plunger when the syringe is dry. Dry pumping of the plunger may cause damage or seizing to occur.

Metal Plungers for NanoVolume Syringes

- Always loosen needle cover nut before removing or inserting NanoVolume syringe plunger.
- Care should be taken if the plunger is removed from the syringe.
- Wipe plunger with a lint-free tissue before replacing into the syringe.
- A heated syringe cleaner is recommended for cleaning needles and plungers of NanoVolume syringes.

PTFE Tipped Plungers

- Avoid unnecessary movement of plungers when the syringe is dry.
- Replacement PTFE tipped plungers are available.

NEEDLE CARE

Needle Selection

The inside diameter of SGE syringe needles have been selected to ensure minimal dead volume without compromising the ability of the syringe to draw samples of normal viscosity. Medium to high viscosity samples should be diluted or a larger ID needle may be required.

To reduce the possibility of bending, choose the widest available needle outside diameter suitable for the application. Autosampler syringes with 0.63mm OD needles should be selected for all applications except on-column injection.

SGE makes various needle tip styles to suit a range of applications and uses. The two most common tip styles are:

- Cone - frequently used on autosampler syringes
- Bevel - popular for manual injection.

Needle Blockages

If a needle blockage occurs, remove the plunger and fill the syringe with solvent using another syringe. Insert the plunger and gently push solvent through the needle.

Never force the plunger as too much pressure may crack the syringe barrel.

Needle Cleaning

- The **SGE Needle Cleaning Kit** (Part Number 031782) contains a range of stylet wires for needle cleaning, tweezers and a surfactant material for barrel cleaning.



Figure 3. Needle Cleaning Kit

External Needle Surfaces

Burrs and surface roughness on needles can be cleaned by using fine emery cloth or carborundum paper. Ensure that the needle is washed thoroughly after deburring.

SYRINGE VALIDATION

Every SGE syringe is supplied with a "Conformance Certificate" which guarantees it conforms to quality and volume specifications. It also provides volume traceability back to International Standards.

Factory calibrated syringes are available upon request.

For more information contact our technical customer support team on: techsupport@sge.com

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