Caltech RESEARCH SAFETY: Prevent Injury, use the Right Syringe

This fact sheet provides information on choosing the right syringe to reduce the risk of injury and exposure to hazardous chemicals. Safe transfer of chemicals via syringe involves selecting the appropriate type of syringe, taking into account material composition, chemical compatibility, maximum volume capacity, and the type of needle connection fitting.

Which syringe material and capacity should I use?

Plastic (disposable)*

3-part syringe: polyethylene (PE)/polypropylene barrel with rubber tipped plunger

- Pre-lubricated with silicone oil
- Compatible with aqueous solutions
- Not recommended for organic solvents

Images courtesy of Air-tite products

2-part syringe: All PE

- Recommended for most organic solvents
- Not recommended for strong acids and bases

Glass and stainless steel (reusable)*

Borosilicate all glass

- Chemical and heat-shock resistant
- Recommended for acids and bases

Images courtesy of Air-tite products

- Glass barrel and PTFE / stainless steel plunger

Images courtesy of HAMILTON

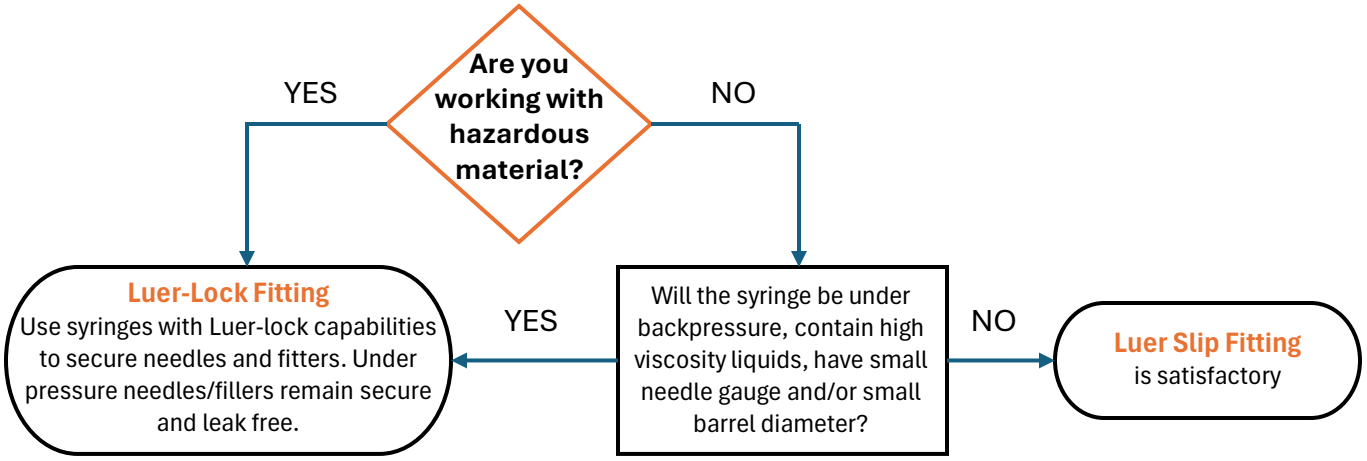
*Consult manufacturer chemical compatibility chart to ensure the syringe material is resistant to your chemical. To minimize the risk of the plunger accidently separating from the syringe barrel, **the maximum volume a syringe should be filled is 75% of the syringe's calibrated volume**.

MOST SYRINGES AND NEEDLES FIT TOGETHER USING A LUER SYSTEM:

- **Luer-lock**
  A secure screw type connection that ensures a more secure and leak resistant fit.

- **Luer-slip**
  Needle is slipped and attached by a friction fit mechanism.

Which Luer syringe fitting tip should I use?



After use, syringe/needle sharps should be disposed in dedicated sharps container.
See Caltech Sharps Safe Handling Practices

STILL NOT SURE?

Call 626-395-6727, email safety@caltech.edu, or visit www.safety.caltech.edu for help concerning the proper selection of syringes.