TRAJAN

# Syringes for the laboratory


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SGE® Syringes

## Trajan Scientific and Medical (Trajan) offer a comprehensive range of syringes that deliver precision and accuracy in analysis and ensure the integrity of analytical samples.

We combine precision manufacturing of components and meticulous assembly, to produce syringes of the highest quality.

SGE® syringes have been a recognized syringe choice in analytical laboratories for over 50 years. They combine precision manufacturing and meticulous assembly for precise volume delivery.

L-MARK® Gold and L-MARK syringes are designed and tested for optimum performance of LC instruments. L-MARK Gold syringes feature a chemically inert needle for extremely low system carryover.

Our comprehensive expertise in liquid handling technologies enables us to develop syringes for a wide range of applications.

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Selection of syringe volume for the best possible reproducibility and accuracy

# Which syringe to use?

**Trajan offers a complete range of syringes with a range of capacities, termination types and needle styles to suit almost any application.**

## What type of syringe?

If the syringe is being used by hand, a manual syringe is selected. If the syringe is being installed in an instrument then select an autosampler syringe to suit that particular instrument. Trajan's extensive range of autosampler syringes are designed to meet all fit, form and function criterial of a specific autosampler model. They meet dimensional specifications and have accuracy ≥ ±1%.


*Manual syringe*


*Autosampler syringe*

The following syringe types* are offered:

| Syringe type | Page(s) |
|---|---|
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** Analytical syringes manufactured by Trajan Scientific and Medical are intended for analytical and laboratory use only and are not intended or approved for use with food, including the production or packaging of food, nor medical or human in-vivo use.*

## Syringe volume

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 less than 1 µL a NanoVolume syringe is recommended. SGE® NanoVolume syringes are available with capacities ranging from 0.5 µL to 5 µL. These syringes can inject volumes as low as 0.05 µL because the entire sample is contained within the needle. Designed with submicron tolerances, they provide precision and accuracy of ±2%.

Trajan's extensive range of autosampler syringes meet all fit, form and function criteria of a specific autosampler model. SGE GC autosampler syringes are color coded according to syringe volume, enabling easy identification of syringes installed in instruments.

| Color | Syringe volumes | | |
|---|---|---|---|
| Light orange | 0.5 µL | 500 µL | |
| Yellow | 1 µL | | 1 mL |
| Lime | 5 µL | | 5 mL |
| Dark orange | | 10 µL | 10 mL |
| Green | | 25 µL | |
| Purple | | 50 µL | |
| Aqua | | 100 µL | |
| Gray | | 250 µL | 2.5 mL |

## Syringe termination

Termination refers to the interface between the syringe barrel and the needle.

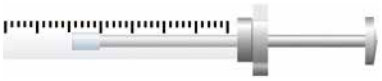
Many syringes are supplied and used with needles attached, such as fixed needle (FN) and removable needle (RN). Other terminations are available where the needle is not supplied - Luer Lock (LL), Luer Tip (LT), and threaded terminations.

| Termination type | Details | Trajan's termination code |
|---|---|---|
| Fixed needle  | • Recommended for autosampler use where the probability of needle bending is minimal. | F |
| Removable needle  | • Allows for the needle to be changed if damaged or for different applications. | R |
| Luer Lock  | • Fixed Luer Lock syringes have a Luer fitting that is permanently attached to the barrel.<br>• Removable needle versions have a Luer fitting that screws onto the barrel with the Luer Tip inserted. | LL |
| Luer Tip  | | LT |
| Thread  | • Screw into a valve or other device, required for some LC autosamplers.<br>• Various threaded terminations are available. | N/A |

# Needle selection

| Needle tip style | Application | Features/applications | Trajan's tip code |
|---|---|---|---|
| Bevel  | Manual GC | • A 20° tip which is typically used for manual injections.<br>• Designed for optimum septa penetration and prevention of septa coring. | BV |
| Cone  | GC autosampler | • Designed to withstand multi-injection requirements and improve septa lifetime when used with a GC autosampler.<br>• The needle passes through the septa during use and does not cause a slit. | C |
| Dual gauge  | On-column injection - autosampler | • Narrow gauge at the tip is suitable for large bore on-column injection.<br>• The wider gauge part of the needle gives increased strength to the needle for autosampler use. | N/A |
| Square  | LC | • Used for LC valve injection and have a 90° square tip with rounded and polished edges.<br>• This eliminates damage to the valve's rotor seal and stator face. | LC |
| Dome  | With pre-drilled septa | • The rounded and polished tip make this needle ideal for use with pre-drilled septa. | D |
| Side hole  | Large volume injection (LVI) | • Samples are filled and dispensed through the side hole eliminating septa plugging of the needle.<br>• Ideal for large volume gas injections and headspace. | H |

# Plunger selection

| Type | Features | Application |
|---|---|---|
| Metal plunger  | • Stainless steel plunger individually fitted to its own syringe barrel.<br>• Plunger is not replaceable nor interchangeable. | • Industry-standard syringe for chromatography applications.<br>• For use when injection volume is greater than 1 µL. |
| PTFE and PE tipped plunger  | • Plunger is replaceable.<br>• Easy to remove and clean to extend plunger lifetime.<br>• Capacities: 10 µL to 100 mL. | • Liquid and gas samples.<br>• Headspace applications.<br>• Ideal for samples with high levels of contaminates. |
| Metal plunger for NanoVolume syringes (plunger-in-needle)  | • Plunger extends into the needle tip.<br>• Sample is contained only in the needle i.e. no glass contact.<br>• Capacities: 0.5 µL, 1 µL and 5 µL. | • Dispensing very small liquid volumes (less than 1 µL). |
| Superflex™ flexible plunger  | • Made from titanium/nickel alloy.<br>• Virtually indestructible plunger.<br>• Capacities: 5 µL and 10 µL. | • Chromatography applications requiring greater plunger durability. |
| Plunger protection  | • Extended protection from the top of the syringe back flange to help prevent plunger bending during injection and improve plunger stroke.<br>• Capacities: 5 µL and 10 µL. | • General use for both experienced and inexperienced users. |
| Guided plunger  | • Extended barrel guides plunger during injection.<br>• Robust and rugged.<br>• Capacities: 5 µL and 10 µL. | • Industrial applications. |

# Syringe care and maintenance

Regular maintenance of a syringe is important for ensuring long life and robust performance.

Syringes should be routinely checked for damage to the barrel and needle. Look for fine cracks in the barrel. Needles should also be checked for burrs and rough surfaces which may cause tearing and excessive wear on the septa.

## Syringe care, cleaning and use

### Needle care: unblocking needles

1. Remove the plunger and fill the syringe with solvent using another syringe.
2. Insert plunger and gently push solvent through the needle. Never force the plunger as too much pressure may crack the syringe barrel.

The syringe needle cleaning kits contain a range of stylet wires for needle cleaning, tweezers, and a surfactant material for barrel cleaning.

*Needle cleaning kit (part number 031782)*

### Syringe cleaning

1. Flush the syringe thoroughly with suitable solvents (such as methanol, methylene chloride, acetonitrile and acetone). Depending on the type of contaminant, this may have to be done up to 20 times.
2. Rinse with distilled water.
3. Flush with acetone.
4. Remove plunger and wipe with tissue.
5. Refit plunger and flush with acetone.
6. Allow syringe to dry.

Cleaning steps for NanoVolume syringes can be found in the manual supplied with the syringe.

### Syringe temperature specifications

Heating will remove semi-volatile material from the syringe. Before heating or autoclaving, remove the plunger.

| Syringe type | Maximum temperature |
|---|---|
| Fixed needle and fixed Luer | 70°C |
| Removable needle and removable Luer | 100°C |
| NanoVolume | 70°C |
| Headspace | 150°C |

Rapid changes in temperature can lead to damage of the glass barrel. Ensure heating and cooling of a syringe is a gradual process.

## Syringe use

- Always inspect the syringe before use. Check the barrel for cracks and the needle tip for burrs.
- To eliminate carryover between samples, flush the syringe with solvent 5-20 times, remembering to discard at least the first 2-3 washes.
- To eliminate air bubbles from the barrel, repeatedly draw and expel the sample while keeping the needle tip immersed in the solution. Bubbles can also be removed by turning the barrel upright while expelling some of the sample. If bubbles persist, slow the aspiration speed.
- To make an injection, overfill the syringe then press the plunger until the correct volume is reached. Draw the plunger back slightly, wipe the needle tip with a lint-free tissue, then make the injection. For improved precision, a repeating adaptor may be used to pre-set the volume.
- Before storage always flush the syringe with solvent and air dry.

## Plunger care

| Plunger type | Recommended care |
|---|---|
| Metal | • Never force the plunger.<br>• Do not pump the plunger when the needle is blocked as the high pressure generated could crack the barrel.<br>• Replacement plungers are not available. Plungers are individually fitted to the barrels to achieve a perfect seal.<br>• Avoid unnecessary movement of plungers when the syringe is dry. |
| Metal for NanoVolume syringes | • Always loosen needle cover nut before removing or inserting plunger.<br>• Wipe plunger with a lint-free tissue before replacing into the syringe. |
| PTFE and polyethylene (PE) tipped | • Avoid unnecessary movement of plungers when the syringe is dry.<br>• Replacement PTFE and PE tipped plungers are available for many syringes. |

## Syringe troubleshooting

| Problem | Cause | Solution |
|---|---|---|
| Blocked needles | Improper cleaning. | Refer to syringe cleaning tips (page 8). |
| | Inappropriate needle selection. | Refer to the needle selection guide (page 7). |
| Seized plungers | Poor dispensing technique. | Ensure correct injection technique is being followed. |
| | Build up of contaminates in samples. | Refer to syringe cleaning tips (page 6). |
| | Syringe installed in autosampler incorrectly. | Ensure the syringe is installed correctly. |
| Poor reproducibility | Incorrect syringe selection. | Refer to the selection guide (page 6), the dispensed volume should be greater than 10% of the entire syringe capacity. |
| | Operator technique. | Check that each sample is being injected in the same way. |
| | Incorrect instrument set up. | Check if any changes have been, or need to be made to your instrument or set up (septa, injection port liner etc.). |
| Air bubbles | Incorrect instrument set up. | Check if any changes have been, or need to be made to your instrument or set up (septa, injection port liner etc.). |
| Leakages | Incorrectly fitted needle. | Remove and refit the needle. Check the seal is in place and undamaged. |
| | No seal at plunger tip – plunger tip damaged or worn due to use or using syringe dry. | Replace plunger assembly if using a PTFE or PE tipped plunger. |
| Ghost peaks | Contaminated needle. | Between samples flush the syringe with solvent 5-20 times (discard at least the first 2-3 washes). |

# SGE GC autosampler syringes | Agilent

## Product specifications and part numbers

| Specifications | | | |
|---|---|---|---|
| Accuracy and reproducibility | ±1% (dispensed volume)<br>(±2% for 0.5 µL and 1 µL syringes) | Scale length | 0.5 µL to 1 µL = 27.05 mm<br>5 µL to 10 µL = 54.1 mm<br>25 µL to 100 µL = 60 mm |
| Borosilicate glass barrel outer diameter (OD) | 0.5 µL to 100 µL = 6.5 mm | International standards traceability | ✓ |


### Agilent 7693A, 7683, 7673, 7650A and 6850ALS

| Syringe part number | Volume | Needle length (mm) | Needle gauge | Needle OD (mm) | Needle ID (mm) | Needle tip | Pack size | Replacement needle part number | Replacement plunger part number |
|---|---|---|---|---|---|---|---|---|---|
| **Fixed needle syringes** | | | | | | | | | |
| 001800 | 5 µL | 42 | 26 | 0.47 | 0.11 | Cone | 1 | - | - |
| 001804 | 5 µL | 42 | 26 | 0.47 | 0.11 | Cone | 6 | - | - |
| 001810 | 5 µL | 42 | 23 | 0.63 | 0.11 | Cone | 1 | - | - |
| 001814 | 5 µL | 42 | 23 | 0.63 | 0.11 | Cone | 6 | - | - |
| 001821 | 5 µL | 42 | 23/26 | 0.63/0.47 | 0.11 | Cone | 1 | - | - |
| 001822 | 5 µL | 42 | 23/26 | 0.63/0.47 | 0.11 | Cone | 6 | - | - |
| 002800 | 10 µL | 42 | 26 | 0.47 | 0.11 | Cone | 1 | - | - |
| 002804 | 10 µL | 42 | 26 | 0.47 | 0.11 | Cone | 6 | - | - |
| 002810 | 10 µL | 42 | 23 | 0.63 | 0.11 | Cone | 1 | - | - |
| 002811 | 10 µL | 42 | 23 | 0.63 | 0.11 | Side hole | 1 | - | - |
| 002813 | 10 µL | 42 | 23 | 0.63 | 0.11 | Cone | 25 | - | - |
| 002814 | 10 µL | 42 | 23 | 0.63 | 0.11 | Cone | 6 | - | - |
| 002821 | 10 µL | 42 | 23/26 | 0.63/0.47 | 0.11 | Cone | 1 | - | - |
| 002822 | 10 µL | 42 | 23/26 | 0.63/0.47 | 0.11 | Cone | 6 | - | - |
| 002824 | 10 µL | 42 | 23/26 | 0.63/0.47 | 0.11 | Cone | 25 | - | - |
| **Fixed needle, gas tight syringes** | | | | | | | | | |
| 002812 | 10 µL | 42 | 23 | 0.63 | 0.11 | Cone | 1 | - | 031808 |
| 002816 | 10 µL | 42 | 23 | 0.63 | 0.11 | Cone | 25 | - | 031808 |
| 002826 | 10 µL | 42 | 23/26 | 0.63/0.47 | 0.11 | Cone | 1 | - | 031808 |
| 002827 | 10 µL | 42 | 23/26 | 0.63/0.47 | 0.11 | Cone | 6 | - | 031808 |
| 003668 | 25 µL | 42 | 23/26 | 0.63/0.47 | 0.24 | Cone | 1 | - | - |
| 004668 | 50 µL | 42 | 23/26 | 0.63/0.47 | 0.24 | Cone | 1 | - | - |
| 005668 | 100 µL | 42 | 23/26 | 0.63/0.47 | 0.24 | Cone | 1 | - | 031823 |
| **Fixed needle syringes with Superflex plunger** | | | | | | | | | |
| 002831 | 10 µL | 42 | 26 | 0.47 | 0.11 | Cone | 6 | - | - |
| 002838 | 10 µL | 42 | 23 | 0.63 | 0.11 | Cone | 6 | - | - |
| **Removable needle syringes** | | | | | | | | | |
| 000400 | 0.5 µL | 42 | 26 | 0.47 | 0.15 | Cone | 1 | 033708* | - |
| 000410 | 0.5 µL | 42 | 23 | 0.63 | 0.15 | Cone | 1 | 033715* | - |
| 000415 | 0.5 µL | 42 | 23/26 | 0.63/0.47 | 0.1 | Cone | 1 | 033730* | - |
| 000610 | 1 µL | 42 | 23 | 0.63 | 0.22 | Cone | 1 | 034715* | - |
| 002805 | 10 µL | 42 | 26 | 0.47 | 0.11 | Cone | 1 | 037715 | - |
| 002815 | 10 µL | 42 | 23 | 0.63 | 0.11 | Cone | 1 | 037717 | - |
| 004665 | 50 µL | 42 | 23 | 0.63 | 0.24 | Cone | 1 | 038717 | - |
| **Removable needle, gas tight syringes** | | | | | | | | | |
| 002820 | 10 µL | 42 | 23 | 0.63 | 0.11 | Cone | 10 | 037717 | 031809 |
| 002829 | 10 µL | 42 | 23/26 | 0.63/0.47 | 0.11 | Cone | 1 | 037730 | 031809 |

*Denotes needle and plunger kit.

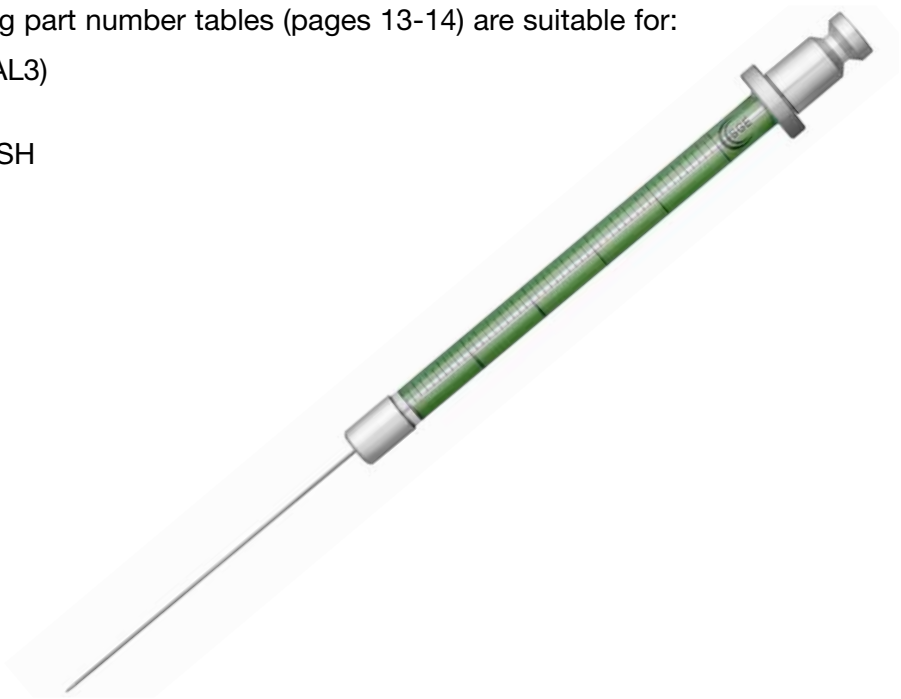
# SGE GC autosampler syringes | CTC Analytics

## Product specifications and part numbers

| Specifications | | | |
|---|---|---|---|
| Accuracy and reproducibility | ±1% (dispensed volume)<br>(±2% for 0.5 µL and 1 µL syringes) | Scale length | 0.5 µL to 1 µL = 27.05 mm<br>5 µL to 10 µL = 54.1 mm<br>25 µL to 5 mL = 60 mm |
| Borosilicate glass barrel outer diameter (OD) | 0.5 µL to 100 µL = 6.5 mm<br>250 µL to 500 µL = 8 mm<br>1 mL = 7.6 mm<br>2.5 mL = 9.7 mm<br>5 mL = 14 mm | International standards traceability | ✓ |

Syringes listed in the following part number tables (pages 13-14) are suitable for:

- CTC Analytics PAL RTC (PAL3)
- Shimadzu AOC-6000
- Thermo Scientific TriPlus RSH
- Agilent PAL3



### CTC Analytics PAL3 RTC, Shimadzu AOC-6000, Thermo Scientific TriPlus RSH and Agilent PAL3

| Syringe part number | Volume | Needle length (mm) | Needle gauge | Needle OD (mm) | Needle ID (mm) | Needle tip | Pack size | Replacement needle part number | Replacement plunger part number |
|---|---|---|---|---|---|---|---|---|---|
| **Fixed needle syringes** | | | | | | | | | |
| 001861 | 5 µL | 57 | 23 | 0.63 | 0.11 | Cone | 1 | - | - |
| 001863 | 5 µL | 85 | 23 | 0.63 | 0.11 | Cone | 1 | - | - |
| 001865 | 5 µL | 57 | 26 | 0.47 | 0.11 | Cone | 1 | - | - |
| 002861 | 10 µL | 57 | 23 | 0.63 | 0.11 | Cone | 1 | - | - |
| 002863 | 10 µL | 85 | 23 | 0.63 | 0.11 | Cone | 1 | - | - |
| 002865 | 10 µL | 57 | 26 | 0.47 | 0.11 | Cone | 1 | - | - |
| 002867 | 10 µL | 85 | 26 | 0.47 | 0.11 | Cone | 1 | - | - |
| 002869 | 10 µL | 85 | 26 | 0.47 | 0.11 | Bevel | 1 | - | - |
| **Fixed needle, gas tight syringes** | | | | | | | | | |
| 002862 | 10 µL | 57 | 23 | 0.63 | 0.11 | Cone | 1 | - | 032810 |
| 002864 | 10 µL | 85 | 23 | 0.63 | 0.11 | Cone | 1 | - | 032810 |
| 002866 | 10 µL | 57 | 26 | 0.47 | 0.11 | Cone | 1 | - | 032810 |
| 002868 | 10 µL | 85 | 26 | 0.47 | 0.11 | Cone | 1 | - | 032810 |

## CTC Analytics PAL3 RTC, Shimadzu AOC-6000, Thermo Scientific TriPlus RSH and Agilent PAL3 continued

| Syringe part number | Volume | Needle length (mm) | Needle gauge | Needle OD (mm) | Needle ID (mm) | Needle tip | Pack size | Replacement needle part number | Replacement plunger part number |
|---|---|---|---|---|---|---|---|---|---|
| **Fixed needle, gas tight syringes continued** | | | | | | | | | |
| 003862 | 25 µL | 57 | 23 | 0.63 | 0.11 | Cone | 1 | - | |
| 003864 | 25 µL | 85 | 23 | 0.63 | 0.11 | Cone | 1 | - | 032815 |
| 003866 | 25 µL | 57 | 26 | 0.47 | 0.11 | Cone | 1 | - | 032815 |
| 003868 | 25 µL | 85 | 26 | 0.47 | 0.11 | Cone | 1 | - | 032815 |
| 004862 | 50 µL | 57 | 23 | 0.63 | 0.11 | Cone | 1 | - | 032821 |
| 004864 | 50 µL | 85 | 23 | 0.63 | 0.11 | Cone | 1 | - | 032821 |
| 004866 | 50 µL | 57 | 26 | 0.47 | 0.11 | Cone | 1 | - | 032821 |
| 004868 | 50 µL | 85 | 26 | 0.47 | 0.11 | Cone | 1 | - | 032821 |
| 005862 | 100 µL | 57 | 23 | 0.63 | 0.11 | Cone | 1 | - | 032825 |
| 005864 | 100 µL | 85 | 23 | 0.63 | 0.11 | Cone | 1 | - | 032825 |
| 005866 | 100 µL | 57 | 26 | 0.47 | 0.11 | Cone | 1 | - | 032825 |
| 005868 | 100 µL | 85 | 26 | 0.47 | 0.11 | Cone | 1 | - | 032825 |
| 005890 | 100 µL | 57 | 23 | 0.63 | 0.32 | Side hole | 1 | - | 032825 |
| 005891 | 100 µL | 85 | 23 | 0.63 | 0.32 | Side hole | 1 | - | 032825 |
| 006862 | 250 µL | 57 | 23 | 0.63 | 0.32 | Cone | 1 | - | 032831 |
| 006864 | 250 µL | 85 | 23 | 0.63 | 0.32 | Cone | 1 | - | 032831 |
| 006866 | 250 µL | 57 | 26 | 0.47 | 0.2 | Cone | 1 | - | 032831 |
| 006868 | 250 µL | 85 | 26 | 0.47 | 0.2 | Cone | 1 | - | 032831 |
| 006890 | 250 µL | 57 | 23 | 0.63 | 0.32 | Side hole | 1 | - | 032831 |
| 006891 | 250 µL | 85 | 23 | 0.63 | 0.32 | Side hole | 1 | - | 032831 |
| 007862 | 500 µL | 57 | 23 | 0.63 | 0.32 | Cone | 1 | - | 032835 |
| 007864 | 500 µL | 85 | 23 | 0.63 | 0.32 | Cone | 1 | - | 032835 |
| 007866 | 500 µL | 57 | 26 | 0.47 | 0.2 | Cone | 1 | - | 032835 |
| 007868 | 500 µL | 85 | 26 | 0.47 | 0.2 | Cone | 1 | - | 032835 |
| 007890 | 500 µL | 57 | 23 | 0.63 | 0.32 | Side hole | 1 | - | 032835 |
| 007891 | 500 µL | 85 | 23 | 0.63 | 0.32 | Side hole | 1 | - | 032835 |
| 008155 | 1 mL | 65 | 23 | 0.63 | 0.15 | Side hole | 1 | - | 032841 |
| 008655 | 2.5 mL | 65 | 23 | 0.63 | 0.15 | Side hole | 1 | - | 032846 |
| 008855 | 5 mL | 65 | 23 | 0.63 | 0.15 | Side hole | 1 | - | 032851 |
| **Removable needle syringes** | | | | | | | | | |
| 000480 | 0.5 µL | 57 | 23 | 0.63 | 0.15 | Cone | 1 | 033780* | - |
| 000680 | 1 µL | 57 | 23 | 0.63 | 0.22 | Cone | 1 | 034780* | - |
| 001871 | 5 µL | 57 | 23 | 0.63 | 0.11 | Cone | 1 | 036871 | - |
| 001875 | 5 µL | 57 | 26 | 0.47 | 0.11 | Cone | 1 | 036875 | - |
| 001877 | 5 µL | 85 | 26 | 0.47 | 0.11 | Cone | 1 | 036877 | - |
| 002871 | 10 µL | 57 | 23 | 0.63 | 0.11 | Cone | 1 | 037871 | - |
| 002875 | 10 µL | 57 | 26 | 0.47 | 0.11 | Cone | 1 | 037875 | - |
| **Removable needle, gas tight syringes** | | | | | | | | | |
| 002872 | 10 µL | 57 | 23 | 0.63 | 0.11 | Cone | 1 | 037871 | 032810 |
| 002874 | 10 µL | 85 | 23 | 0.63 | 0.11 | Cone | 1 | 037873 | 032810 |
| 002876 | 10 µL | 57 | 26 | 0.47 | 0.11 | Cone | 1 | 037875 | 032810 |
| 002878 | 10 µL | 85 | 26 | 0.47 | 0.11 | Cone | 1 | 037877 | 032810 |

*Denotes needle and plunger kit.

# SGE GC autosampler syringes | PerkinElmer

## Product specifications and part numbers

| Specifications | | | |
|---|---|---|---|
| Accuracy and reproducibility | ±1% (dispensed volume)<br>(±2% for 0.5 µL syringes) | Scale length | 0.5 µL to 5 µL = 27.05 mm<br>50 µL = 54.1 mm |
| Borosilicate glass barrel outer diameter (OD) | 0.5 µL to 50 µL = 6.5 mm | International standards traceability | ✓ |

### PerkinElmer Clarus 690, 590, 600, 500 and AutoSystem

| Syringe part number | Volume | Needle length (mm) | Needle gauge | Needle OD (mm) | Needle ID (mm) | Needle tip | Pack size | Replacement needle part number | Replacement plunger part number |
|---|---|---|---|---|---|---|---|---|---|
| **Fixed needle syringes** | | | | | | | | | |
| 001953 | 5 µL | 70 | 26 | 0.47 | 0.15 | Cone | 1 | - | - |
| 001954 | 5 µL | 70 | 23 | 0.63 | 0.15 | Cone | 1 | - | - |
| 004670 | 50 µL | 70 | 23 | 0.63 | 0.24 | Cone | 1 | - | - |
| **Fixed needle, gas tight syringes** | | | | | | | | | |
| 001955 | 5 µL | 70 | 26 | 0.47 | 0.15 | Cone | 1 | - | 031807 |
| 001957 | 5 µL | 70 | 23 | 0.63 | 0.15 | Cone | 1 | - | 031807 |
| **Removable needle syringes** | | | | | | | | | |
| 000475 | 0.5 µL | 70 | 26 | 0.47 | 0.1 | Cone | 1 | 033750* | - |
| 000478 | 0.5 µL | 70 | 23 | 0.63 | 0.1 | Cone | 1 | 033765* | - |

*Denotes needle and plunger kit.

# SGE GC autosampler syringes | Scion Instruments

## Product specifications and part numbers

| Specifications | | | |
|---|---|---|---|
| Accuracy and reproducibility | ±1% (dispensed volume) | Scale length | 5 µL to 25 µL = 54.1 mm |
| Borosilicate glass barrel outer diameter (OD) | 5 µL to 25 µL = 6.5 mm | International standards traceability | ✓ |

### Scion Instruments 8410 PRO and 8400 PRO

| Syringe part number | Volume | Needle length (mm) | Needle gauge | Needle OD (mm) | Needle ID (mm) | Needle tip | Pack size | Replacement plunger part number |
|---|---|---|---|---|---|---|---|---|
| **Fixed needle syringes** | | | | | | | | |
| 0019811 | 5 µL | 50 | 23 | 0.63 | 0.11 | Cone | 1 | - |
| 0019821 | 5 µL | 50 | 26 | 0.47 | 0.11 | Cone | 1 | - |
| 0029801 | 10 µL | 50 | 26 | 0.47 | 0.11 | Cone | 1 | - |
| 0029861 | 10 µL | 50 | 26 | 0.47 | 0.11 | Cone | 6 | - |
| **Fixed needle, gas tight syringes** | | | | | | | | |
| 0029761 | 10 µL | 50 | 26 | 0.47 | 0.11 | Cone | 6 | 03181201 |
| 0029771 | 10 µL | 50 | 26 | 0.47 | 0.11 | Cone | 1 | 03181201 |
| 0029871 | 10 µL | 50 | 23 | 0.63 | 0.11 | Cone | 1 | 03181201 |
| 0039871 | 25 µL | 50 | 23 | 0.63 | 0.24 | Cone | 1 | 0318171 |

# SGE GC autosampler syringes | Shimadzu

## Product specifications and part numbers

| Specifications | | | |
|---|---|---|---|
| Accuracy and reproducibility | ±1% (dispensed volume)<br>(±2% for 0.5 µL syringes) | Scale length | 0.5 µL = 27.05 mm<br>5 µL to 10 µL = 54.1 mm |
| Borosilicate glass barrel outer diameter (OD) | 0.5 µL to 10 µL = 6.5 mm | International standards traceability | ✓ |


### Shimadzu AOC-20i, AOC-20, AOC-17 and AOC-14

| Syringe part number | Volume | Needle length (mm) | Needle gauge | Needle OD (mm) | Needle ID (mm) | Needle tip | Pack size | Replacement needle part number | Replacement plunger part number |
|---|---|---|---|---|---|---|---|---|---|
| **Fixed needle syringes** | | | | | | | | | |
| 001988 | 5 µL | 42 | 23 | 0.63 | 0.11 | Cone | 1 | - | - |
| **Removable needle syringes** | | | | | | | | | |
| 000440 | 0.5 µL | 42 | 26 | 0.47 | 0.1 | Cone | 1 | 033738* | - |
| 000445 | 0.5 µL | 42 | 23 | 0.63 | 0.1 | Cone | 1 | 033745* | - |
| 002897 | 10 µL | 42 | 26 | 0.47 | 0.11 | Cone | 1 | 037745 | - |
| 002898 | 10 µL | 42 | 23 | 0.63 | 0.11 | Cone | 1 | 037747 | - |
| **Removable needle, gas tight syringes** | | | | | | | | | |
| 002902 | 10 µL | 42 | 23 | 0.63 | 0.11 | Cone | 1 | 037747 | 031798 |

*Denotes needle and plunger kit.

# SGE GC autosampler syringes | Thermo Scientific

## Product specifications and part numbers

| Specifications | | | |
|---|---|---|---|
| Accuracy and reproducibility | ±1% (dispensed volume)<br>(±2% for 0.5 µL and 2 µL syringes) | Scale length | 0.5 µL to 1 µL = 27.05 mm<br>5 µL to 10 µL = 54.1 mm<br>25 µL to 5 mL = 60 mm |
| Borosilicate glass barrel outer diameter (OD) | 0.5 µL to 100 µL = 6.5 mm<br>250 µL to 500 µL = 8 mm<br>1 mL = 7.6 mm<br>2.5 mL = 9.7 mm<br>5 mL = 14 mm | International standards traceability | ✓ |

For syringes for TriPlus RSH, see pages 11-12 and 17.


### Thermo Scientific AI/AS 1610, AI/AS 1310 and TriPlus

| Syringe part number | Volume | Needle length (mm) | Needle gauge | Needle OD (mm) | Needle ID (mm) | Needle tip | Pack size | Replacement needle part number | Replacement plunger part number |
|---|---|---|---|---|---|---|---|---|---|
| **Fixed needle syringes** | | | | | | | | | |
| 001981 | 5 µL | 50 | 23 | 0.63 | 0.11 | Cone | 1 | - | - |
| 001982 | 5 µL | 50 | 26 | 0.47 | 0.11 | Cone | 1 | - | - |
| 002967 | 10 µL | 50 | 25 | 0.5 | 0.11 | Cone | 1 | - | - |
| 002971 | 10 µL | 50 | 23 | 0.63 | 0.11 | Cone | 6 | - | - |
| 002980 | 10 µL | 50 | 26 | 0.47 | 0.11 | Cone | 1 | - | - |
| 002981 | 10 µL | 50 | 23 | 0.63 | 0.11 | Cone | 1 | - | - |
| 002986 | 10 µL | 50 | 26 | 0.47 | 0.11 | Cone | 6 | - | - |
| **Fixed needle, gas tight syringes** | | | | | | | | | |
| 002972 | 10 µL | 50 | 23 | 0.63 | 0.11 | Cone | 6 | - | 031803 (PK1)<br>0318120 (PK2) |
| 002976 | 10 µL | 50 | 26 | 0.47 | 0.11 | Cone | 6 | - | 031803 (PK1)<br>0318120 (PK2) |
| 002977 | 10 µL | 50 | 26 | 0.47 | 0.11 | Cone | 1 | - | 031803 (PK1)<br>0318120 (PK2) |
| 002987 | 10 µL | 50 | 23 | 0.63 | 0.11 | Cone | 1 | - | 031803 (PK1)<br>0318120 (PK2) |
| 003987 | 25 µL | 50 | 23 | 0.63 | 0.24 | Cone | 1 | - | 031817 |
| 005335 | 100 µL | 50 | 23 | 0.63 | 0.24 | Cone | 1 | - | 0318261 |
| 008131 | 1 mL | 56 | 23 | 0.63 | 0.15 | Side hole | 1 | - | 031841 |
| 008136 | 1 mL | 56 | 26 | 0.47 | 0.15 | Side hole | 1 | - | 031841 |
| 008631 | 2.5 mL | 56 | 23 | 0.63 | 0.15 | Side hole | 1 | - | 031851 |
| 008636 | 2.5 mL | 56 | 26 | 0.47 | 0.15 | Side hole | 1 | - | 031851 |
| 008831 | 5 mL | 56 | 23 | 0.63 | 0.15 | Side hole | 1 | - | 031861 |
| **Removable needle syringes** | | | | | | | | | |
| 000490 | 0.5 µL | 50 | 26 | 0.47 | 0.15 | Cone | 1 | 033770* | - |
| 000492 | 0.5 µL | 50 | 23 | 0.63 | 0.15 | Cone | 1 | 033772* | - |
| 000790 | 2 µL | 50 | 23 | 0.63 | 0.22 | Cone | 1 | 034905* | - |
| 001984 | 5 µL | 50 | 23 | 0.63 | 0.11 | Cone | 1 | 036011 | - |
| 002982 | 10 µL | 50 | 26 | 0.47 | 0.11 | Cone | 1 | 037010 | - |
| 002984 | 10 µL | 50 | 23 | 0.63 | 0.11 | Cone | 1 | 037787 | - |
| **Removable needle, gas tight syringes** | | | | | | | | | |
| 002985 | 10 µL | 50 | 26 | 0.47 | 0.11 | Cone | 1 | 037010 | 0318121 |
| 003988 | 25 µL | 50 | 26 | 0.47 | 0.24 | Side hole | 1 | 038749 | 031816 |
| 005333 | 100 µL | 50 | 26 | 0.47 | 0.2 | Cone | 1 | 038732 | 031826 |

*Denotes needle and plunger kit.

## Thermo Scientific AS3000 and AS2000

| Syringe part number | Volume | Needle length (mm) | Needle gauge | Needle OD (mm) | Needle ID (mm) | Needle tip | Pack size | Replacement needle part number | Replacement plunger part number |
|---|---|---|---|---|---|---|---|---|---|
| **Fixed needle syringes** | | | | | | | | | |
| 0019811 | 5 µL | 50 | 23 | 0.63 | 0.11 | Cone | 1 | - | - |
| 0019821 | 5 µL | 50 | 26 | 0.47 | 0.11 | Cone | 1 | - | - |
| 0029671 | 10 µL | 50 | 25 | 0.5 | 0.11 | Cone | 1 | - | - |
| 0029741 | 10 µL | 80 | 22 | 0.72 | 0.17 | Cone | 1 | - | - |
| 0029781 | 10 µL | 70 | 26 | 0.47 | 0.11 | Cone | 1 | - | - |
| 0029801 | 10 µL | 50 | 26 | 0.47 | 0.11 | Cone | 1 | - | - |
| 0029861 | 10 µL | 50 | 26 | 0.47 | 0.11 | Cone | 6 | - | - |
| 0029891 | 10 µL | 80 | 23 | 0.63 | 0.11 | Cone | 1 | - | - |
| 0029921 | 10 µL | 80 | 26 | 0.47 | 0.15 | Cone | 1 | - | - |
| **Fixed needle, gas tight syringes** | | | | | | | | | |
| 0029761 | 10 µL | 50 | 26 | 0.47 | 0.11 | Cone | 6 | - | 03181201 |
| 0029771 | 10 µL | 50 | 26 | 0.47 | 0.11 | Cone | 1 | - | 03181201 |
| 0029871 | 10 µL | 50 | 23 | 0.63 | 0.11 | Cone | 1 | - | 03181201 |
| 0039871 | 25 µL | 50 | 23 | 0.63 | 0.24 | Cone | 1 | - | 0318171 |
| **Removable needle syringes** | | | | | | | | | |
| 0029841 | 10 µL | 50 | 23 | 0.63 | 0.11 | Cone | 1 | 037787 | - |
| 0029931 | 10 µL | 80 | 26 | 0.47 | 0.15 | Cone | 1 | 031535 | - |

# L-MARK® LC autosampler syringes | CTC Analytics

## Product specifications and part numbers

| Specifications | | | |
|---|---|---|---|
| Accuracy and reproducibility | ±1% (dispensed volume) | Scale length | 10 µL = 54.1 mm<br>25 µL to 10 mL = 60 mm |
| Borosilicate glass barrel outer diameter (OD) | 10 µL to 100 µL = 6.5 mm<br>250 µL to 500 µL = 8 mm<br>1 mL = 7.6 mm<br>5 mL = 14 mm<br>10 mL = 18 mm | International standards traceability | ✓ |

### CTC Analytics PAL DLW (Dynamic Load and Wash)

| Syringe part number | Volume | Pack size | Replacement needle part number (PK3) | Replacement plunger part number (PK6) |
|---|---|---|---|---|
| LMK.2620736 | 100 µL | 1 | LMK.21080733 | LMK.2636735 |
| LMK.2620740 | 100 µL | 1 | LMK.21080733 | - |
| LMK.2620735-BL | 100 µL | 1 | LMK.21080733 | LMK.2636735-BL |
| LMK.2620835-BL | 250 µL | 1 | LMK.21080733 | LMK.2636835-BL |
| LMK.2620935-BL | 500 µL | 1 | LMK.21080733 | LMK.2636935-BL |
| LMK.2620080-BL | 1 mL | 1 | LMK.21080733 | LMK.2636086-BL |


### CTC Analytics PAL3 RTC and Thermo Scientific TriPlus RSH

| Syringe part number | Volume | Needle length (mm) | Needle gauge | Needle OD (mm) | Needle ID (mm) | Needle tip | Pack size |
|---|---|---|---|---|---|---|---|
| **Fixed needle, gas tight syringes (PTFE plunger)** | | | | | | | |
| LMK.2616422C* | 10 µL | 57 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.2616422 | 10 µL | 57 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.3030021 | 10 µL | 85 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.3030022 | 25 µL | 57 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.2616502C* | 25 µL | 57 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.2616704C* | 100 µL | 57 | 22 | 0.72 | 0.37 | LC | 1 |
| LMK.3030908 | 100 µL | 85 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.2616822 | 250 µL | 57 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.3030029 | 250 µL | 57 | 22 | 0.72 | 0.37 | LC | 1 |
| LMK.2616922 | 500 µL | 57 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.3030031 | 1 mL | 57 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.3030095 | 5 mL | 57 | 22 | 0.72 | 0.37 | LC | 1 |
| LMK.3030485 | 10 mL | 57 | 19 | 1.07 | 0.65 | LC | 1 |

*Denotes L-MARK Gold syringe.

## CTC Analytics PAL-xt

| Syringe part number | Volume | Needle length (mm) | Needle gauge | Needle OD (mm) | Needle ID (mm) | Needle tip | Pack size |
|---|---|---|---|---|---|---|---|
| L-MARK Gold syringes | | | | | | | |
| **Fixed needle, gas tight syringes (PTFE plunger)** | | | | | | | |
| LMK.2606416C | 10 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.2606416C-6P | 10 µL | 51 | 22s | 0.72 | 0.17 | LC | 6 |
| LMK.2620517C | 25 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.2620517C-6P | 25 µL | 51 | 22s | 0.72 | 0.17 | LC | 6 |
| LMK.2620521C | 25 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 |
| LMK.2620617C | 50 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.2620615C | 50 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 |
| LMK.2620719C | 100 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.2620719C-2P | 100 µL | 51 | 22s | 0.72 | 0.17 | LC | 2 |
| LMK.2620719C-6P | 100 µL | 51 | 22s | 0.72 | 0.17 | LC | 6 |
| LMK.2620721C | 100 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 |
| LMK.2620721C-6P | 100 µL | 51 | 22 | 0.72 | 0.37 | LC | 6 |
| LMK.2620821C | 250 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 |
| LMK.2620821C-6P | 250 µL | 51 | 22 | 0.72 | 0.37 | LC | 6 |
| **Fixed needle, gas tight syringes (black PTFE plunger)** | | | | | | | |
| LMK.2606416C-BL | 10 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.2620517C-BL | 25 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.2620617C-BL | 50 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.2620615C-BL | 50 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 |
| LMK.2620719C-BL | 100 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.2620719CBL6 | 100 µL | 51 | 22s | 0.72 | 0.17 | LC | 6 |
| LMK.2620721C-BL | 100 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 |
| LMK.2620821C-BL | 250 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 |
| **Fixed needle, gas tight syringes (PE plunger)** | | | | | | | |
| LMK.2620518C | 25 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.2620616C | 50 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.2620616C-6P | 50 µL | 51 | 22s | 0.72 | 0.17 | LC | 6 |
| LMK.2620614C | 50 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 |
| LMK.2620718C | 100 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 |
| LMK.2620720C | 100 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 |
| LMK.2620820C | 250 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 |

## CTC Analytics PAL-xt continued

| Syringe part number | Volume | Needle length (mm) | Needle gauge | Needle OD (mm) | Needle ID (mm) | Needle tip | Pack size | Replacement plunger part number |
|---|---|---|---|---|---|---|---|---|
| L-MARK syringes | | | | | | | | |
| Fixed needle, gas tight syringes (PTFE plunger) | | | | | | | | |
| LMK.2606416 | 10 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 | - |
| LMK.2606416-2P | 10 µL | 51 | 22s | 0.72 | 0.17 | LC | 2 | - |
| LMK.2606416-6P | 10 µL | 51 | 22s | 0.72 | 0.17 | LC | 6 | - |
| LMK.2620517 | 25 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 | LMK.2636505 |
| LMK.2620517-2P | 25 µL | 51 | 22s | 0.72 | 0.17 | LC | 2 | LMK.2636505-2P |
| LMK.2620517-6P | 25 µL | 51 | 22s | 0.72 | 0.17 | LC | 6 | LMK.2636505-6P |
| LMK.2620617 | 50 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 | LMK.2636605 |
| LMK.2620617-2P | 50 µL | 51 | 22s | 0.72 | 0.17 | LC | 2 | LMK.2636605-2P |
| LMK.2620617-6P | 50 µL | 51 | 22s | 0.72 | 0.17 | LC | 6 | LMK.2636605-6P |
| LMK.2620615 | 50 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 | LMK.2636605 |
| LMK.2620615-2P | 50 µL | 51 | 22 | 0.72 | 0.37 | LC | 2 | LMK.2636605-2P |
| LMK.2620615-6P | 50 µL | 51 | 22 | 0.72 | 0.37 | LC | 6 | LMK.2636605-6P |
| LMK.2620719 | 100 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 | LMK.2636707 |
| LMK.2620719-2P | 100 µL | 51 | 22s | 0.72 | 0.17 | LC | 2 | LMK.2636707-2P |
| LMK.2620719-6P | 100 µL | 51 | 22s | 0.72 | 0.17 | LC | 6 | LMK.2636707-6P |
| LMK.2620721 | 100 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 | LMK.2636707 |
| LMK.2620721-2P | 100 µL | 51 | 22 | 0.72 | 0.37 | LC | 2 | LMK.2636707-2P |
| LMK.2620721-6P | 100 µL | 51 | 22 | 0.72 | 0.37 | LC | 6 | LMK.2636707-6P |
| LMK.2620821 | 250 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 | - |
| LMK.2620821-2P | 250 µL | 51 | 22 | 0.72 | 0.37 | LC | 2 | - |
| LMK.2620821-6P | 250 µL | 51 | 22 | 0.72 | 0.37 | LC | 6 | - |
| Fixed needle, gas tight syringes (black PTFE plunger) | | | | | | | | |
| LMK.2606416BL | 10 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 | - |
| LMK.2606416B-6P | 10 µL | 51 | 22s | 0.72 | 0.17 | LC | 6 | - |
| LMK.2620517BL | 25 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 | - |
| LMK.2620617BL | 50 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 | - |
| LMK.2620617BL6P | 50 µL | 51 | 22s | 0.72 | 0.17 | LC | 6 | - |
| LMK.2620719-BL | 100 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 | - |
| LMK.2620719B-6P | 100 µL | 51 | 22s | 0.72 | 0.17 | LC | 6 | - |
| Fixed needle, gas tight syringes (PE plunger) | | | | | | | | |
| LMK.2620518 | 25 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 | - |
| LMK.2620518-6P | 25 µL | 51 | 22s | 0.72 | 0.17 | LC | 6 | - |
| LMK.2620616 | 50 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 | LMK.2636606 |
| LMK.2620616-2P | 50 µL | 51 | 22s | 0.72 | 0.17 | LC | 2 | LMK.2636606-2P |
| LMK.2620616-6P | 50 µL | 51 | 22s | 0.72 | 0.17 | LC | 6 | LMK.2636606-6P |
| LMK.2620614 | 50 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 | LMK.2636606 |
| LMK.2620614-2P | 50 µL | 51 | 22 | 0.72 | 0.37 | LC | 2 | LMK.2636606-2P |
| LMK.2620614-6P | 50 µL | 51 | 22 | 0.72 | 0.37 | LC | 6 | LMK.2636606-6P |
| LMK.2620718 | 100 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 | LMK.2636708 |
| LMK.2620718-2P | 100 µL | 51 | 22s | 0.72 | 0.17 | LC | 2 | LMK.2636708-2P |
| LMK.2620718-6P | 100 µL | 51 | 22s | 0.72 | 0.17 | LC | 6 | LMK.2636708-6P |
| LMK.2620720 | 100 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 | LMK.2636708 |
| LMK.2620720-2P | 100 µL | 51 | 22 | 0.72 | 0.37 | LC | 2 | LMK.2636708-2P |
| LMK.2620720-6P | 100 µL | 51 | 22 | 0.72 | 0.37 | LC | 6 | LMK.2636708-6P |
| LMK.2620820 | 250 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 | LMK.2636808 |
| LMK.2620820-2P | 250 µL | 51 | 22 | 0.72 | 0.37 | LC | 2 | LMK.2636808-2P |
| LMK.2620820-6P | 250 µL | 51 | 22 | 0.72 | 0.37 | LC | 6 | LMK.2636808-6P |

# SGE LC autosampler syringes | PerkinElmer

## Product specifications and part numbers

| Specifications | | | |
|---|---|---|---|
| Accuracy and reproducibility | ±1% (dispensed volume) | Scale length | 50 µL to 2.5 mL = 60 mm |
| Borosilicate glass barrel outer diameter (OD) | 50 µL to 500 µL = 8 mm<br>1 mL = 9 mm<br>2.5 mL = 11 mm | International standards traceability | ✓ |


### PerkinElmer Series 200

| Syringe part number | Volume | Termination | Pack size |
|---|---|---|---|
| 004995 | 50 µL | ¼-28 UNF | 1 |
| 005990 | 100 µL | ¼-28 UNF | 1 |
| 006995 | 250 µL | ¼-28 UNF | 1 |
| 007995 | 500 µL | ¼-28 UNF | 1 |
| 008185 | 1 mL | ¼-28 UNF | 1 |
| 008687 | 2.5 mL | ¼-28 UNF | 1 |

# SGE LC autosampler syringes | Waters

## Product specifications and part numbers

| Specifications | | | |
|---|---|---|---|
| Accuracy and reproducibility | ±1% (dispensed volume) | Scale length | 25 µL to 250 µL = 60 mm |
| Borosilicate glass barrel outer diameter (OD) | 25 µL to 250 µL = 8 mm | International standards traceability | ✓ |


### Waters WISP

| Syringe part number | Volume | Termination | Pack size | Replacement plunger part number |
|---|---|---|---|---|
| 003990 | 25 µL | ¼-28 UNF | 1 | 031819 |
| 006690 | 250 µL | ¼-28 UNF | 1 | 031834 |

# SGE LC manual syringes | Rheodyne and Valco

## Product specifications and part numbers

| Specifications | | | |
|---|---|---|---|
| Accuracy and reproducibility | ±1% (dispensed volume) | Scale length | 5 µL to 10 µL = 54.1 mm<br>25 µL to 2.5 mL = 60 mm |
| Borosilicate glass barrel outer diameter (OD) | 5 µL to 10 µL= 6.5 mm<br>25 µL to 500 µL = 8 mm<br>1 mL = 9 mm<br>2.5 mL = 11 mm | International standards traceability | ✓ |


### Rheodyne and Valco valves

| Syringe part number | Volume | Needle length (mm) | Needle gauge | Needle OD (mm) | Needle ID (mm) | Needle tip | Pack size | Replacement needle part number | Replacement plunger part number |
|---|---|---|---|---|---|---|---|---|---|
| **Fixed needle syringes** | | | | | | | | | |
| 001301 | 5 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 | - | - |
| 002301 | 10 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 | - | - |
| 002315 | 10 µL | 51 | 22s | 0.72 | 0.17 | LC | 6 | - | - |
| 003300 | 25 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 | - | - |
| 004300 | 50 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 | - | - |
| 005300 | 100 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 | - | - |
| 006300 | 250 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 | - | - |
| 007300 | 500 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 | - | - |
| **Fixed needle, gas tight syringes** | | | | | | | | | |
| 002335 | 10 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 | - | 031810 |
| **Fixed needle syringes with Superflex plunger** | | | | | | | | | |
| 002300 | 10 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 | - | - |
| 002330 | 10 µL | 51 | 22s | 0.72 | 0.17 | LC | 6 | - | - |
| **Removable needle syringes** | | | | | | | | | |
| 006310 | 250 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 | 038250 | - |
| 007310 | 500 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 | 038250 | - |
| **Removable needle, gas tight syringes** | | | | | | | | | |
| 002313 | 10 µL | 51 | 22s | 0.72 | 0.17 | LC | 1 | 037250 | 031811 |
| 003312 | 25 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 | 038250 | 031815 |
| 004312 | 50 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 | 038250 | 031820 |
| 005312 | 100 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 | 038250 | 031825 |
| 006312 | 250 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 | 038250 | 031830 |
| 007312 | 500 µL | 51 | 22 | 0.72 | 0.37 | LC | 1 | 038250 | 031835 |
| 008105 | 1 mL | 51 | 22 | 0.72 | 0.37 | LC | 1 | 039250 | 031842 |
| 008505 | 2.5 mL | 51 | 22 | 0.72 | 0.37 | LC | 1 | 039250 | - |

# SGE syringes | NanoVolume

## Product specifications and part numbers

| Specifications | | | |
|---|---|---|---|
| Accuracy and reproducibility | ±2% (dispensed volume) | Scale length | 0.5 µL and 1 µL = 54.1 mm<br>5 µL = 48.7 mm |
| Borosilicate glass barrel outer diameter (OD) | 0.5 µL to 5 µL= 8 mm (except part numbers 000300, 000301, 000303, 000350, 000353 = 6.5 mm) | International standards traceability | ✓ |

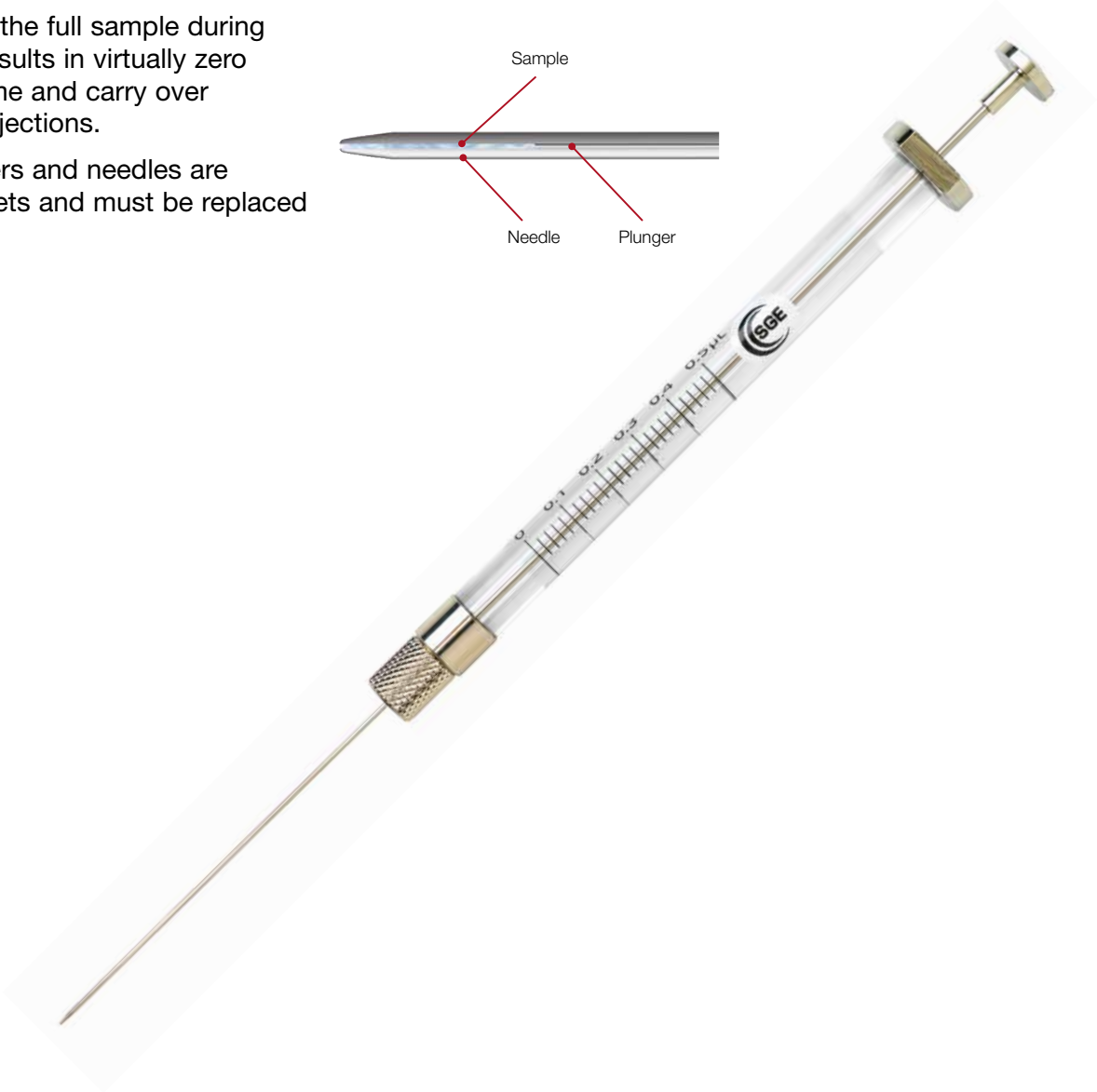
With the ability to inject down to 50 nL with high precision and accuracy, SGE NanoVolume syringes are perfect for NanoVolume capillary chromatography injection as well as making accurate standards that require small volumes.

The sample is only drawn into the needle, not the syringe barrel. When the plunger is depressed, the sample is completely dispensed by the NanoVolume plunger that extends to the tip of the needle.

Displacing the full sample during injection results in virtually zero dead volume and carry over between injections.

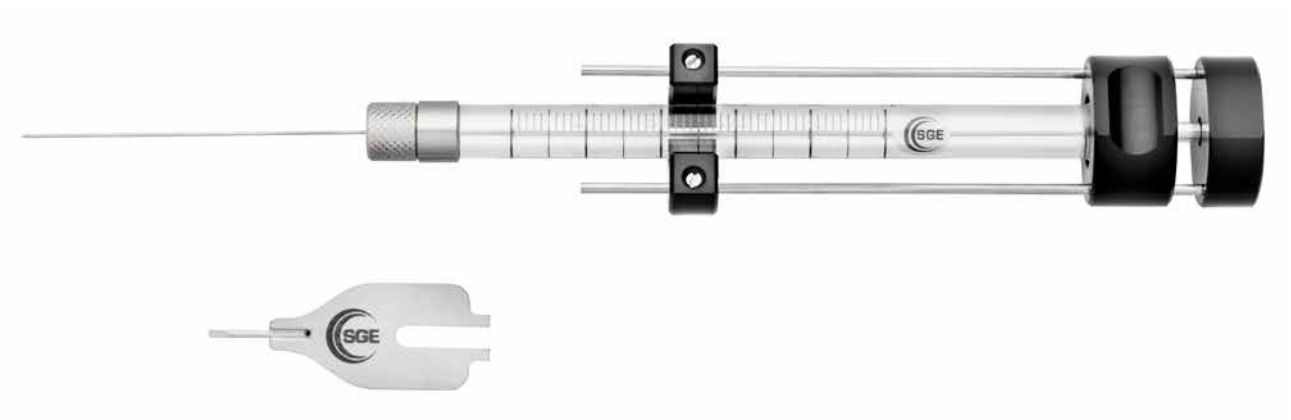
The plungers and needles are matched sets and must be replaced as a set.



## NanoVolume syringes

| Syringe part number | Volume | Needle length (mm) | Needle gauge | Needle OD (mm) | Needle ID (mm) | Needle tip | Pack size | Replacement needle and plunger part number |
|---|---|---|---|---|---|---|---|---|
| **NanoVolume syringes** | | | | | | | | |
| 000300 | 0.5 µL | 50 | 23 | 0.63 | 0.15 | Cone | 1 | 033010 |
| 000301 | 0.5 µL | 50 | 23 | 0.63 | 0.15 | Bevel | 1 | 033011 |
| 000303 | 0.5 µL | 50 | 26 | 0.47 | 0.15 | Cone | 1 | 033012 |
| 000310 | 0.5 µL | 70 | 23 | 0.63 | 0.1 | Cone | 1 | 033057 |
| 000311 | 0.5 µL | 70 | 23 | 0.63 | 0.1 | Bevel | 1 | 033060 |
| 000376 | 0.5 µL | 70 | 26 | 0.47 | 0.1 | Cone | 1 | 033630 |
| 000380 | 0.5 µL | 75 | 26 | 0.47 | 0.1 | On-column | 1 | 033620 |
| 000500 | 1 µL | 50 | 23 | 0.63 | 0.15 | Cone | 1 | 034055 |
| 000501 | 1 µL | 50 | 23 | 0.63 | 0.15 | Bevel | 1 | 034056 |
| 000505 | 1 µL | 70 | 23 | 0.63 | 0.15 | Cone | 1 | 034057 |
| 000506 | 1 µL | 70 | 23 | 0.63 | 0.15 | Bevel | 1 | 034060 |
| 000510 | 1 µL | 115 | 23 | 0.63 | 0.15 | Cone | 1 | 034059 |
| 000570 | 1 µL | 70 | 26 | 0.47 | 0.15 | Cone | 1 | 034610 |
| 000800 | 5 µL | 50 | 23 | 0.63 | 0.37 | Cone | 1 | 035055 |
| 000801 | 5 µL | 50 | 23 | 0.63 | 0.37 | Bevel | 1 | 035056 |
| 000802 | 5 µL | 70 | 23 | 0.63 | 0.37 | Cone | 1 | 035057 |
| 000803 | 5 µL | 70 | 23 | 0.63 | 0.37 | Bevel | 1 | 035058 |
| 000804 | 5 µL | 115 | 23 | 0.63 | 0.37 | Cone | 1 | - |
| **NanoVolume syringes with repeating adaptor** | | | | | | | | |
| 000350 | 0.5 µL | 50 | 23 | 0.63 | 0.15 | Cone | 1 | 033010 |
| 000353 | 0.5 µL | 50 | 26 | 0.47 | 0.15 | Cone | 1 | 033012 |
| 000355 | 0.5 µL | 70 | 23 | 0.63 | 0.1 | Cone | 1 | 033057 |
| 000550 | 1 µL | 50 | 23 | 0.63 | 0.15 | Cone | 1 | 034055 |
| 000553 | 1 µL | 70 | 23 | 0.63 | 0.15 | Cone | 1 | 034057 |
| 000850 | 5 µL | 50 | 23 | 0.63 | 0.37 | Cone | 1 | 035055 |
| 000852 | 5 µL | 70 | 23 | 0.63 | 0.37 | Cone | 1 | 035057 |



## Product specifications and part numbers

| Specifications | | | |
|---|---|---|---|
| Accuracy and reproducibility | Operator dependent | Scale length | 5 µL to 10 µL = 54.1 mm<br>25 µL to 10 mL = 60 mm |
| Borosilicate glass barrel outer diameter (OD) | 5 µL to 10 µL = 6.5 mm<br>25 µL to 500 µL = 8 mm<br>1 mL = 9 mm<br>2.5 mL = 11 mm<br>5 mL = 14 mm<br>10 mL = 18 mm | International standards traceability | ✓ |


### General purpose manual syringes

| Syringe part number | Volume | Needle length (mm) | Needle gauge | Needle OD (mm) | Needle ID (mm) | Needle tip | Pack size | Replacement needle part number | Replacement plunger part number |
|---|---|---|---|---|---|---|---|---|---|
| **Fixed needle, metal syringes** | | | | | | | | | |
| 001000 | 5 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 1 | - | - |
| 002000 | 10 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 1 | - | - |
| 002003 | 10 µL | 70 | 26 | 0.47 | 0.11 | Bevel | 1 | - | - |
| 002005 | 10 µL | 50 | 26 | 0.47 | 0.11 | Cone | 1 | - | - |
| 002030 | 10 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 6 | - | - |
| 002033 | 10 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 10 | - | - |
| 002035 | 10 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 25 | - | - |
| 003000 | 25 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | - | - |
| 004000 | 50 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | - | - |
| 005000 | 100 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | - | - |
| 006000 | 250 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | - | - |
| 007000 | 500 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | - | - |
| **Fixed needle, gas tight syringes** | | | | | | | | | |
| 002200 | 10 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 1 | - | 031810 |
| 002202 | 10 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 6 | - | 031810 |
| 002208 | 10 µL | 70 | 26 | 0.47 | 0.11 | Bevel | 6 | - | 031810 |
| 003200 | 25 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | - | 031815 |
| 004200 | 50 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | - | 031820 |
| 005200 | 100 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | - | 031825 |
| 006200 | 250 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | - | 031830 |
| 007200 | 500 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | - | 031835 |
| 008102 | 1 mL | 50 | 22 | 0.72 | 0.37 | Bevel | 1 | - | 0318441 |
| 008502 | 2.5 mL | 50 | 22 | 0.72 | 0.37 | Bevel | 1 | - | 031852 |
| **Fixed needle syringes with flexible plunger** | | | | | | | | | |
| 001100 | 5 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 1 | - | - |
| 002100 | 10 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 1 | - | - |
| 002105 | 10 µL | 50 | 26 | 0.47 | 0.11 | Cone | 1 | - | - |
| 002130 | 10 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 6 | - | - |
| 002133 | 10 µL | 50 | 26 | 0.47 | 0.11 | Cone | 6 | - | - |
| 002135 | 10 µL | 50 | 23 | 0.63 | 0.11 | Cone | 6 | - | - |
| **Fixed needle syringes with guided plunger** | | | | | | | | | |
| 001400 | 5 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 1 | - | - |
| 002400 | 10 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 1 | - | - |

## General purpose manual syringes continued

| Syringe part number | Volume | Needle length (mm) | Needle gauge | Needle OD (mm) | Needle ID (mm) | Needle tip | Pack size | Replacement needle part number | Replacement plunger part number |
|---|---|---|---|---|---|---|---|---|---|
| **Removable needle syringes** | | | | | | | | | |
| 001050 | 5 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 1 | 036110 | - |
| 002050 | 10 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 1 | 037110 | - |
| 002080 | 10 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 6 | 037110 | - |
| 002180* | 10 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 6 | 037110 | - |
| 003050 | 25 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | 038110 | - |
| 004050 | 50 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | 038110 | - |
| 005050 | 100 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | 038110 | - |
| 005055 | 100 µL | 70 | 25 | 0.5 | 0.2 | Bevel | 1 | 038130 | - |
| 006050 | 250 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | 038110 | - |
| 007050 | 500 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | 038110 | - |
| **Removable needle, gas tight syringes** | | | | | | | | | |
| 002250 | 10 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 1 | 037110 | 031811 |
| 002252 | 10 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 6 | 037110 | 031811 |
| 003250 | 25 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | 038110 | 031815 |
| 004250 | 50 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | 038110 | 031820 |
| 005250 | 100 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | 038110 | 031825 |
| 006250 | 250 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | 038110 | 031830 |
| 007250 | 500 µL | 50 | 25 | 0.5 | 0.2 | Bevel | 1 | 038110 | 031835 |
| 008100 | 1 mL | 50 | 23 | 0.63 | 0.32 | Bevel | 1 | 039110 | 031842 |
| 008500 | 2.5 mL | 50 | 23 | 0.63 | 0.32 | Bevel | 1 | 039110 | 031852 |
| 008700 | 5 mL | 50 | 23 | 0.63 | 0.32 | Bevel | 1 | 031516 | 031856 |
| 008900 | 10 mL | 50 | 23 | 0.63 | 0.32 | Bevel | 1 | 031516 | 031862 |
| **Removable needle, guided plunger syringes** | | | | | | | | | |
| 001450 | 5 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 1 | 036110 | - |
| 001495 | 5 µL (half scale) | 50 | 26 | 0.47 | 0.11 | Bevel | 1 | 037110 | - |
| 002450 | 10 µL | 50 | 26 | 0.47 | 0.11 | Bevel | 1 | 037110 | - |
| 002455 | 10 µL (GT) | 50 | 26 | 0.47 | 0.11 | Bevel | 1 | 037110 | 031805 |
| **Removable needle, valve syringes** | | | | | | | | | |
| 004279 | 50 µL | 50 | 23 | 0.63 | 0.2 | Bevel | 1 | - | 031820 |
| 005279 | 100 µL | 50 | 23 | 0.63 | 0.2 | Bevel | 1 | - | 031825 |
| 006279 | 250 µL | 50 | 23 | 0.63 | 0.2 | Bevel | 1 | - | 031830 |
| 007279 | 500 µL | 50 | 23 | 0.63 | 0.2 | Bevel | 1 | - | 031835 |
| 008110 | 1 mL | 50 | 23 | 0.63 | 0.2 | Bevel | 1 | - | 031842 |
| 008510 | 2.5 mL | 50 | 23 | 0.63 | 0.2 | Bevel | 1 | - | 031852 |

*Denotes repeating adaptor.

# SGE syringes | Luer Lock and Luer Tip

## Product specifications and part numbers

| Specifications | | | |
|---|---|---|---|
| Accuracy and reproducibility | Operator dependent | Scale length | 50 µL to 25 mL = 60 mm<br>50 mL = 84.2 mm<br>100 mL = 104 mm |
| Borosilicate glass barrel outer diameter (OD) | 50 µL to 500 µL = 8 mm<br>1 mL = 9 mm<br>2.5 mL = 11 mm<br>5 mL = 14 mm<br>10 mL = 18 mm<br>25 mL = 27 mm<br>50 mL = 32.8 mm<br>100 mL = 40.8 mm | Thread in plunger stem | 6-32 UNC |
| | | International standards traceability | ✓ |

Luer Lock and Luer Tip terminations offer universal connections for a number of different applications. This allows different needles or accessories to be connected quickly for workflows in analytical settings. This termination type can used with a valve to enable samples to be easily stored and transported prior to analyses, from the field to the laboratory.

## Luer Lock and Luer Tip syringes

| Syringe part number | Volume | Pack size | Replacement plunger part number |
|---|---|---|---|
| **Fixed, gas tight Luer Tip syringes** | | | |
| 004229 | 50 µL | 1 | 031820 |
| 005229 | 100 µL | 1 | 031825 |
| 006229 | 250 µL | 1 | 031830 |
| 007229 | 500 µL | 1 | 031835 |
| 008020 | 1 mL | 1 | 031842 |
| 008420 | 2.5 mL | 1 | 031852 |
| **Fixed, gas tight Luer Lock syringes** | | | |
| 004230 | 50 µL | 1 | 031820 |
| 004232* | 50 µL | 1 | - |
| 005230 | 100 µL | 1 | 031825 |
| 005232* | 100 µL | 1 | - |
| 006230 | 250 µL | 1 | 031830 |
| 006232* | 250 µL | 1 | - |
| 007230 | 500 µL | 1 | 031835 |
| 007232* | 500 µL | 1 | - |
| 008025 | 1 mL | 1 | 0318441 |
| 008425 | 2.5 mL | 1 | 031852 |
| 008762 | 5 mL | 1 | 0318562 |
| 008962 | 10 mL | 1 | 031864 |
| 009463 | 25 mL | 1 | 031874 |
| **Removable, gas tight Luer Lock syringes** | | | |
| 008760 | 5 mL | 1 | 031856 |
| 008960 | 10 mL | 1 | 031862 |
| 009462 | 25 mL | 1 | 031870 |
| 009660 | 50 mL | 1 | 0312170 |
| 009760 | 100 mL | 1 | 0312176 |
| **Removable, gas tight Luer Lock valve syringes** | | | |
| 008160 | 1 mL | 1 | 031842 |
| 008560 | 2.5 mL | 1 | 031852 |
| 008770 | 5 mL | 1 | 031856 |
| 008970 | 10 mL | 1 | 031862 |
| 009472 | 25 mL | 1 | 031870 |
| 009670 | 50 mL | 1 | 0312170 |
| 009770 | 100 mL | 1 | 0312176 |

*Denotes plunger stop.

# Hamilton cross reference

## Variation notes:

F = fixed, N = needle, GT = gas tight, with PTFE tipped plunger,
LL = Luer Lock, LT = Luer Tip, OC = On-column, R = removable, WO = without

| Hamilton part number | Part description and detail | Trajan part number | Volume | Termination | Needle length | Gauge | Needle tip | Equivalent or option | Variation |
|---|---|---|---|---|---|---|---|---|---|
| 160310 | 1750 HITACHI SYRINGE | 007660 | 500 µL | M10 GT | - | - | - | E | - |
| 202640 | 701RSN AOC 14/17(22s/1.69"/2) | 002898 | 10 µL | RN | 42 mm | 23 | Cone | O | 23 g needle |
| 202660 | 1002LTN FN CTC SYR (22/56/5) | 008631 | 2.5 mL | FN GT | 56 mm | 23 | Side hole | O | 23 g needle |
| 202880 | 701RN VARIAN 8100/8200 (26s/57/5) | 002924 | 10 µL | RN GT | 53 mm | 25 | Side hole | O | 25 g needle, 53 mm length |
| 203043 | 1702N CTC SYRINGE (26s/51/AS) | 003700 | 25 µL | FN GT | 50 mm | 26 | Cone | O | 26 g needle |
| 203072 | SYR,701 FN CTC,SLIM (26s/51/2) | 002980 | 10 µL | FN | 50 mm | 26 | Cone | O | 26 g cone tipped needle |
| 203073 | 701N FN CTC SYRINGE (22s/51/3) | 002710 | 10 µL | FN | 51 mm | 22s | LC | E | |
| 203074 | SYR,1702 FN CTC,SLIM (26s/51/AS) | 0039871 | 25 µL | FN GT | 50 mm | 23 | Cone | O | 23 g needle |
| 203075 | 1702N FN CTC SYRINGE (22s/51/3) | 003715 | 25 µL | FN GT | 51 mm | 22s | LC | E | - |
| 203076 | SYR,1710 FN CTC,SLIM (26s/51/AS) | 005700 | 100 µL | FN GT | 50 mm | 26 | Cone | E | - |
| 203077 | SYR,1710N FN CTC,SLIM (22s/51/3) | 005715 | 100 µL | FN GT | 51 mm | 22s | LC | E | - |
| 203078 | 1725N FN CTC SYRINGE (26/51/AS) | 006700 | 250 µL | FN GT | 50 mm | 26 | Cone | E | - |
| 203079 | 1725N CTC SYRINGE (22/51/LC) | LMK.2620821 | 250 µL | FN GT | 51 mm | 22 | LC | E | - |
| 203082 | 1001LTN CTC SYRINGE (23/56/5) | 008131 | 1 mL | FN GT | 56 mm | 23 | Side hole | E | - |
| 203084 | 1002LTN CTC SYRINGE (23/56/5) | 008631 | 2.5 mL | FN GT | 56 mm | 23 | Side hole | E | - |
| 203141 | 1001LTN CTC SYRINGE (26/56/5) | 008136 | 1 mL | FN GT | 56 mm | 26 | Side hole | E | - |
| 203181 | 1002LTN CTC SYRINGE (26/56/5) | 008636 | 2.5 mL | FN GT | 56 mm | 26 | Side hole | E | - |
| 203185 | 7701.2 CTC SYRINGE (26/51/AS) | 000790 | 2.0 µL | RN | 50 mm | 23 | Cone | O | 2 µL instead of 1.2 µL |
| 203189 | 75 FN CTC SYRINGE (26s/51/AS) | 001982 | 5 µL | FN | 50 mm | 26 | Cone | O | 26 g needle |
| 203194 | 1701N CTC SYRINGE (22s/51/3) | LMK.2606416 | 10 µL | FN | 51 mm | 22s | LC | E | - |
| 203205 | 701 FN CTC SYRINGE (26s/51/AS) | 002700 | 10 µL | FN | 50 mm | 26 | Cone | O | 26 g needle |
| 203235 | 1710 FN CTC SYRINGE (22/51/3) | 005720 | 100 µL | FN GT | 51 mm | 22 | LC | E | - |
| 203235 | 1710N CTC SYRINGE (22/51/3) | LMK.2620721 | 100 µL | FN GT | 51 mm | 22 | LC | E | - |
| 203274 | 1702N CTC SYRINGE (22s/51/3) | LMK.2620517 | 25 µL | FN GT | 51 mm | 22s | LC | E | - |
| 203349 | 1750 FN CTC SYR (22/51/3) | 007720 | 500 µL | FN GT | 51 mm | 22 | LC | E | - |
| 203361 | 701 FN CTC SYR (23S/51/AS) | 002981 | 10 µL | FN | 50 mm | 23 | Cone | O | 23 g needle |
| 203362 | 701 FN CTC SYR (23S-26S/51/AS) | 002980 | 10 µL | FN | 50 mm | 26 | Cone | O | 26 g needle |
| 203363 | 701 FN CTC SYR (23S/51/2) | 002981 | 10 µL | FN | 50 mm | 23 | Cone | O | 23 g cone tipped needle |
| 203566 | 1710 CTC A200S SYR (22s/51/3) | 005331 | 100 µL | FN GT | 51 mm | 22s | LC | E | - |
| 204000 | SYRINGE,75N(26S/50/2) | 0019821 | 5 µL | FN | 50 mm | 26 | Cone | O | 26 g cone tipped needle |
| 204001 | SYRINGE,701SN(26S/50/2) | 0029801 | 10 µL | FN | 50 mm | 26 | Cone | O | 26 g cone tipped needle |
| 204051 | SYRINGE,75SN(26S/50/AS) | 0019821 | 5 µL | FN | 50 mm | 26 | Cone | O | 26 g needle |
| 204052 | SYRINGE,701SN 26S/50/AS) | 0029801 | 10 µL | FN | 50 mm | 26 | Cone | O | 26 g needle |
| 204379 | 1705 CTC SYRINGE (22s/51/3) | LMK.2620617C | 50 µL | FN GT | 51 mm | 22s | LC | E | - |
| 204400 | 1710 CTC SYRINGE (22/51/LC) | LMK.2620721C | 100 µL | FN GT | 51 mm | 22 | LC | E | - |
| 204452 | 1710 CTC SYRINGE (22s/51/LC) | LMK.2620719C | 100 µL | FN GT | 51 mm | 22s | LC | E | - |
| 204475 | 1702 CTC SYRINGE (22s/51/LC) | LMK.2620517C | 25 µL | FN GT | 51 mm | 22s | LC | E | - |
| 207189 | 701 FN PAL3 (26S/85/AS) | 002867 | 10 µL | FN | 85 mm | 26 | Cone | O | 26 g needle |
| 207290 | 1002 FN CTC PAL3 (23/65/5)HS | 008655 | 2.5 mL | FN GT | 65 mm | 23 | Side hole | E | - |
| 207292 | 1010 RN CTC PAL3(19/57/3) | 008951 | 10 mL | FN GT | 57 mm | 19 | LC | E | - |
| 207803 | 701 FN PAL3 (23S/57/AS) | 002861 | 10 µL | FN | 57 mm | 23 | Cone | O | 23 g needle |
| 207807 | 701 FN PAL3 (26S/57/AS) | 002865 | 10 µL | FN | 57 mm | 26 | Cone | O | 26 g needle |
| 207813 | 1701 RN PAL3 (22S/57/3) | 002880 | 10 µL | FN GT | 57 mm | 22 | LC | O | 22 g needle |

| Hamilton part number | Part description and detail | Trajan part number | Volume | Termination | Needle length | Gauge | Needle tip | Equivalent or option | Variation |
|---|---|---|---|---|---|---|---|---|---|
| 207826 | 1710 PAL3 (22s/57/LC) | LMK.3030908 | 100 µL | FN GT | 57 mm | 22s | LC | E | - |
| 207829 | 1725 FN PAL3 (23/57/AS) | 006862 | 250 µL | FN GT | 57 mm | 23 | LC | E | - |
| 207831 | 1725 FN PAL3 (26/85/AS) | 006868 | 250 µL | FN GT | 85 mm | 26 | LC | E | - |
| 207832 | 1750 PAL3 (22/57/LC) | LMK.2616922 | 500 µL | FN GT | 57 mm | 22 | LC | E | - |
| 207836 | 1001 FN PAL3 (22/57/3) | 008150 | 1 mL | FN GT | 57 mm | 22 | LC | E | - |
| 207837 | 1701 FN PAL3 (26S/57/AS) | 002866 | 10 µL | FN GT | 57 mm | 26 | Cone | O | 26 g needle |
| 207839 | 1701 FN PAL3 (23S/57/AS) | 002862 | 10 µL | FN GT | 57 mm | 23 | Cone | O | 23 g needle |
| 207840 | 1710 FN PAL3 (26S/57/AS) | 005866 | 100 µL | FN GT | 57 mm | 26 | Cone | O | 26 g needle |
| 207853 | 1001 FN CTC PAL3 (23/65/5)HS | 008155 | 1 mL | FN GT | 65 mm | 23 | Side hole | E | - |
| 208311 | 1710 PAL3 (22/57/LC) | LMK.2616704C | 100 µL | FN GT | 57 mm | 22 | Cone | E | - |
| 54658-01 | SYRINGE,1710C,AUTO SAMPLER | 005696 | 100 µL | GT | - | - | - | E | - |
| 54659-01 | SYRINGE,1725C,AUTO SAMPLER | 006683 | 250 µL | GT | - | - | - | E | - |
| 54660-01 | SYRINGE,1750C,AUTO SAMPLER | 007696 | 500 µL | GT | - | - | - | E | - |
| 54661-01 | SYRINGE,1001C,AUTO SAMPLER | 008196 | 1 mL | GT | - | - | - | E | - |
| 54662-01 | SYRINGE,1002C,AUTO SAMPLER | 008596 | 2.5 mL | GT | - | - | - | E | - |
| 62161-01 | SYRINGE,1702C,SPARK AUTO | 003696 | 25 µL | GT | - | - | - | E | - |
| 67430-01 | SYR,1702N,(23/51/AS),CTC-S | 003700 | 25 µL | FN GT | 50 mm | 26 | Cone | O | 26 g needle |
| 67432-01 | SYR,1710N,(22S/51/3),CTC-S-X | 005331 | 100 µL | FN GT | 51 mm | 22 | LC | O | 22 g needle |
| 67434-01 | SYR,1710N,(23/51/AS),CTC-S | 005335 | 100 µL | FN GT | 50 mm | 23 | Cone | E | - |
| 67436-01 | SYR,75N,(26S/51/AS),CTC-S | 0019821 | 5 µL | FN | 50 mm | 26 | Cone | O | 26 g needle |
| 67438-01 | SYR,701N,(26S/51/AS),CTC-S | 0029801 | 10 µL | FN | 50 mm | 26 | Cone | O | 26 g needle |
| 67440-01 | SYR,701SN,(23S/51/AS),CTC-S | 002951 | 10 µL | FN | 50 mm | 23 | Cone | O | 23 g needle |
| 67442-01 | SYR,1725N,(22/51/3),CTC-S | 006720 | 250 µL | FN GT | 51 mm | 22 | LC | E | - |
| 67442-01 | SYR,1725N,(22/51/3),CTC-S | LMK.2620821 | 250 µL | FN GT | 51 mm | 22 | LC | E | - |
| 67444-01 | SYR,1701N,(22/51/3),CTC-S | LMK.2606416 | 10 µL | FN GT | 51 mm | 22s | LC | O | 22s g needle |
| 67446-01 | SYR,1702N,(22S/51/3),CTC-S | 003715 | 25 µL | FN GT | 51 mm | 22 | LC | O | 22 g needle |
| 67446-01 | SYR,1702N,(22S/51/3),CTC-S | LMK.2620517 | 25 µL | FN GT | 51 mm | 22 | LC | O | 22 g needle |
| 67448-01 | SYR,1750N,(22/51/3),CTC-S | 007720 | 500 µL | FN GT | 51 mm | 22 | LC | E | - |
| 67450-01 | SYR,1705N,(22/51/3),CTC-S | 004810 | 50 µL | FN GT | 51 mm | 22 | LC | E | - |
| 67450-01 | SYR,1705N,(22/51/3),CTC-S | LMK.2620615 | 50 µL | FN GT | 51 mm | 22 | LC | E | - |
| 67452-01 | SYR,1710SN,(22S/51/3),CTC-S | 005715 | 100 µL | FN GT | 51 mm | 22 | LC | O | 22 g needle |
| 67452-01 | SYR,1710SN,(22S/51/3),CTC-S | LMK.2620719 | 100 µL | FN GT | 51 mm | 22 | LC | O | 23 g needle |
| 67454-01 | SYR,1701SN,(23S/51/AS),CTC-S | 0029871 | 10 µL | FN GT | 50 mm | 23 | Cone | O | 23 g needle |
| 80000 | 1701N 10 µL SYR (26s/2"/2) | 002200 | 10 µL | FN GT | 50 mm | 26 | Bevel | O | 26 g needle |
| 80004 | 1701NCH 10 µL SYR (26s/2"/2) | 002200 + 031930 | 10 µL | FN GT | 50 mm | 26 | Bevel | O | 26 g needle |
| 80020 | 1702 WISP SYR 25 µL | 003990 | 25 µL | GT | - | - | - | E | - |
| 80024 | 1725 WISP SYR 250 µL | 006690 | 250 µL | GT | - | - | - | E | - |
| 80030 | 1701RN 10 µL SYR (26s/2"/2) | 002250 | 10 µL | RN GT | 50 mm | 26 | Bevel | O | 26 g needle |
| 80039 | 1701NPT5 FN 10 µL SYR (26s/2"/5) | 002250 + 037410 | 10 µL | RN GT | 50 mm | 26 | Side hole | O | 26 g RN |
| 80065 | 1701RNR 10 µL SYR (22s/2"/3) | 002313 | 10 µL | RN GT | 51 mm | 22 | LC | O | 22 g needle |
| 80074 | SYRINGE,175ASN FN,23S GA,1.71 | 001810 | 5 µL | FN | 42 mm | 23 | Cone | O | Not GT, full scale 5 µL instead of half scale 10 µL |
| 80074 | SYRINGE,175ASN FN,23S GA,1.71 | 002812 | 10 µL | FN GT | 42 mm | 23 | Cone | O | Full scale 10 µL instead of half scale 5 µL |
| 80075 | 1701N 10 µL SYR (26s/2"/3) | 002335 | 10 µL | FN GT | 51 mm | 22 | LC | O | 22 g needle |
| 80076 | 175ASN FN SYR (23-26/1.71"/HP) | 001821 | 5 µL | FN | 42 mm | 23/26 | Cone | O | Not GT, full scale 5 µL instead of half scale 10 µL |
| 80076 | 175ASN FN SYR (23-26/1.71"/HP) | 002826 | 10 µL | FN GT | 42 mm | 23/26 | Cone | O | Full scale 10 µL instead of half scale 5 µL |

| Hamilton part number | Part description and detail | Trajan part number | Volume | Termination | Needle length | Gauge | Needle tip | Equivalent or option | Variation |
|---|---|---|---|---|---|---|---|---|---|
| 80079 | 1701ASN SYR(23S/26S/1.71"/HP) | 002826 | 10 µL | FN GT | 42 mm | 23/26 | Cone | O | 23/26 g needle |
| 80080 | 1701ASN SYR (23s/1.71"/HP) | 002812 | 10 µL | FN GT | 42 mm | 23 | Cone | O | 23 g needle |
| 80084 | 175AS RN(23s/1.71"/HP) | 002829 | 10 µL | RN GT | 42 mm | 23/26 | Cone | O | Dual gauge needle, full scale 10 µL instead of half scale 5 µL |
| 80085 | 1701N 10 µL SYR (26/2"/3) | 002335 | 10 µL | FN GT | 51 mm | 22s | LC | O | 22s g needle |
| 80086 | 175AS RN SYR (23-26/1.71"/HP) | 002829 | 10 µL | RN GT | 42 mm | 23/26 | Cone | O | Full scale 10 µL instead of half scale 5 µL |
| 80087 | 1701ASRN 10 µL SYR 23s/1.71"/HP | 002829 | 10 µL | RN GT | 42 mm | 23/26 | Cone | O | Dual gauge needle |
| 80088 | 1701ASRN 10 µL SYR 26s/1.71"/HP | 002829 | 10 µL | RN GT | 42 mm | 23/26 | Cone | O | Dual gauge needle |
| 80089 | 1701ASRN SYR (23S/26S/1.71/HP) | 002829 | 10 µL | RN GT | 42 mm | 23/26 | Cone | O | 23/26 g needle |
| 80090 | 175ASN FN 5 µL (23S/1.71"/HP) 6/PK | 002812 | 10 µL | FN GT | 42 mm | 23 | Cone | O | Full scale 10 µL instead of half scale 5 µL |
| 80090 | 175ASN FN 5 µL (23S/1.71"/HP) 6/PK | 002816 | 10 µL | RN GT | 42 mm | 23 | Cone | O | Full scale 10 µL instead of half scale 5 µL |
| 80092 | 175ASN FN 5 µL (23-26/1.71"/HP) 6/PK | 002827 | 10 µL | FN GT | 42 mm | 23/26 | Cone | O | Full scale 10 µL instead of half scale 5 µL |
| 80094 | 1701ASN SYR (23s/1.71"/HP) 6/PK | 002812 | 10 µL | FN GT | 42 mm | 23 | Cone | O | PK1 |
| 80094 | 1701ASN SYR (23s/1.71"/HP) 6/PK | 002816 | 10 µL | FN GT | 42 mm | 23 | Cone | O | PK1 |
| 80096 | 1701ASN (23-26/1.71"/HP) 6/PK | 002827 | 10 µL | FN GT | 42 mm | 23/26 | Cone | E | - |
| 80100 | 7001KH 1 µL SYR (25/2.75"/3) | 000570 | 1.0 µL | RN | 70 mm | 26 | Cone | O | 26 g cone tipped needle |
| 80104 | 7001KHCH 1 µL SYR (25/2.75"/3) | 000570 + 031930 | 1.0 µL | RN | 70 mm | 26 | Cone | O | 26 g cone tipped needle |
| 80107 | 7001KHWG 1 µL SYR (25s/2.75"/3) | 000570 + 031930 | 1.0 µL | RN | 70 mm | 26 | Cone | O | 26 g cone tipped needle |
| 80135 | 7001KH 1.0 µL SYR (25/2.75"/2) | 000506 | 1.0 µL | RN | 70 mm | 23 | Cone | O | 23 g needle |
| 80175 | 7001ASRN (26/1.71"/HP) | 000610 | 1.0 µL | RN | 42 mm | 23 | Cone | O | 23 g needle |
| 80176 | 7001ASRN (23/1.71"/HP) | 000610 | 1.0 µL | RN | 42 mm | 23 | Cone | E | - |
| 80200 | 1702N 25 µL SYR (22s/2"/2) | 003200 | 25 µL | FN GT | 50 mm | 25 | Bevel | O | 25 g needle |
| 80201 | 1702LT 25 µL SYR | 004229 | 50 µL | F LT GT | - | - | - | O | 50 µL |
| 80222 | 1702TLLX 25 µL SYR | 004232 | 50 µL | F LL GT | - | - | - | O | 50 µL |
| 80223 | 1702TLLX SYR W/BSHG STD BTN | 004232 | 50 µL | F LL GT | - | - | - | O | 50 µL, non-adjustable plunger stop |
| 80230 | 1702RN 25 µL SYR (22s/2"/2) | 003250 | 25 µL | RN GT | 50 mm | 25 | Bevel | O | 25 g needle |
| 80238 | 1702RNW 25 µL SYR (25s/1.97"/3) | 003250 + 038260 | 25 µL | RN GT | 50 mm | 25s | LC (Waters) | E | - |
| 80239 | 1702NPT5 25 µL SYR (22s/2"/5) | 003250 + 038410 | 25 µL | RN GT | 50 mm | - | Side hole | O | 25 g RN |
| 80265 | 1702RNR 25 µL SYR (22s/2"/3) | 003312 | 25 µL | RN GT | 51 mm | 22 | LC | O | 22 g needle |
| 80275 | 1702N 25 µL SYR (22s/2"/3) | 003300 | 25 µL | FN | 51 mm | 22 | LC | O | Not GT, 22 g needle |
| 80285 | 1702N 25 µL SYR (22/2"/3) | 003300 | 25 µL | FN | 51 mm | 22 | LC | O | Not GT |
| 80300 | 701N 10 µL SYR (26s/2"/2) | 002000 | 10 µL | FN | 50 mm | 26 | Bevel | O | 26 g needle |
| 80300 | 701N 10 µL SYR (26s/2"/2) | 002950 | 10 µL | FN | 50 mm | 26 | Bevel | O | 26 g needle |
| 80304 | 701NCH 10 µL SYR (26s/2"/2) | 002000 + 031930 | 10 µL | FN | 50 mm | 26 | Bevel | O | 26 g needle |
| 80307 | 701NWG 10 µL SYR (26s/2"/2) | 002000 + 031930 | 10 µL | FN | 50 mm | 26 | Bevel | O | 26 g needle |
| 80318 | 701SN 10 µL SYR (26s/3.15"/AS) | 0029921 | 10 µL | FN | 80 mm | 26 | Cone | O | 26 g needle |

| Hamilton part number | Part description and detail | Trajan part number | Volume | Termination | Needle length | Gauge | Needle tip | Equivalent or option | Variation |
|---|---|---|---|---|---|---|---|---|---|
| 80330 | 701RN 10 µL SYR (26s/2"/2) | 002050 | 10 µL | RN | 50 mm | 26 | Bevel | O | 26 g needle |
| 80334 | 701RNCH 10 µL SYR (26s/2"/2) | 002050 + 031930 | 10 µL | RN | 50 mm | 26 | Bevel | O | 26 g needle |
| 80336 | 701RN 10 µL SYR 6/PK (26s/2"/2) | 002080 | 10 µL | RN | 50 mm | 26 | Bevel | O | 26 g needle |
| 80337 | 701RNWG 10 µL SYR (26s/2"/2) | 002050 + 031930 | 10 µL | RN | 50 mm | 26 | Bevel | O | 26 g needle |
| 80339 | 701NPT5 10 µL SYR (26s/2"/5) | 002050 + 037410 | 10 µL | RN | 50 mm | 26 | Side hole | O | 26 g RN |
| 80342 | 701SN 10 µL SYR (23s/2"/HP) | 002005 | 10 µL | FN | 50 mm | 26 | Cone | O | 26 g needle |
| 80350 | 701SN 10 µL SYR (26s/2.75"/2) | 002003 | 10 µL | FN | 70 mm | 26 | Bevel | O | 26 g needle |
| 80357 | 701ASRN 10 µL SYR (23s/1.71"/HP) | 002815 | 10 µL | RN | 42 mm | 23 | Cone | O | 23 g needle |
| 80358 | 701ASRN 10 µL SYR (26s/1.71"/HP) | 002805 | 10 µL | RN | 42 mm | 26 | Cone | O | 26 g needle |
| 80359 | 701ASRN 10 µL (23-26/1.71"/HP) | 002829 | 10 µL | RN GT | 42 mm | 23/26 | Cone | O | GT |
| 80360 | 901N 10 µL SYR (26s/2"/2) | 002400 | 10 µL | FN | 50 mm | 26 | Bevel | O | 26 g needle |
| 80365 | 701SNR 10 µL SYR (22s/2"/3) | 002301 | 10 µL | FN | 51 mm | 22s | LC | E | - |
| 80366 | 701N 10 µL SYR 6/PK (26s/2"/2) | 002030 | 10 µL | FN | 50 mm | 26 | Bevel | O | 26 g needle |
| 80370 | 901RN 10 µL SYR (26s/2"/2) | 002450 | 10 µL | RN | 50 mm | 26 | Bevel | O | 23 g needle |
| 80383 | 701SN 10 µL SYR (26s/2"/3) | 002301 | 10 µL | FN | 51 mm | 22s | LC | O | 22s g needle |
| 80384 | 701SN 10 µL SYR (26s/3"/2) | 002003 | 10 µL | FN | 70 mm | 26 | Bevel | O | 70 mm needle |
| 80387 | 701ASN 10 µL SYR (23s/1.71"/HP) | 002810 | 10 µL | FN | 42 mm | 23 | Cone | O | 23 g needle |
| 80388 | 701ASN 10 µL SYR (26s/1.71"/HP) | 002800 | 10 µL | FN | 42 mm | 26 | Cone | O | 26 g needle |
| 80389 | 701ASN 10 µL SYR-HP 26s (6/PK) | 002804 | 10 µL | FN | 42 mm | 26 | Cone | O | 26 g needle |
| 80390 | 701ASN 10 µL SYR-HP 23s (6/PK) | 002814 | 10 µL | FN | 42 mm | 23 | Cone | O | 23 g needle |
| 80391 | 701ASN 6/PK (23s-26s/1.71"/HP) | 002822 | 10 µL | FN | 42 mm | 23/26 | Cone | O | Dual gauge needle |
| 80393 | 701ASN SYR (23s-26s/1.71"/HP) | 002821 | 10 µL | FN | 42 mm | 23/26 | Cone | O | Dual gauge needle |
| 80398 | 701ASN 10 µL SYR (23S/1.71"/2) | 002810 | 10 µL | FN | 42 mm | 23 | Cone | O | 23 g cone tipped needle |
| 80399 | 701ASN 10 µL SYR (26S/1.71"/2) | 002800 | 10 µL | FN | 42 mm | 26 | Cone | O | 26 g cone tipped needle |
| 80400 | 702N 25 µL SYR (22s/2"/2) | 003000 | 25 µL | FN | 50 mm | 25 | Bevel | O | 25 g needle |
| 80404 | 702NCH FN 25 µL SYR (22s/2"/2) | 003000 + 031930 | 25 µL | FN | 50 mm | 25 | Bevel | O | 25 g needle |
| 80407 | 702NWG 25 µL SYR (22s/2"/2) | 003000 + 031930 | 25 µL | FN | 50 mm | 25 | Bevel | O | 25 g needle |
| 80419 | 702SN FN 25 µL SYR (22/2"/3) | 003300 | 25 µL | FN | 51 mm | 22 | LC | E | - |
| 80430 | 702RN 25 µL SYR (22s/2"/2) | 003050 | 25 µL | RN | 50 mm | 25 | Bevel | O | 25 g needle |
| 80439 | 702NPT5 25 µL SYR (22s/2"/5) | 003050 + 038410 | 25 µL | RN | 50 mm | 25 | Side hole | O | 25 g RN |
| 80465 | 702SNR 25 µL SYR (22s/2"/3) | 003300 | 25 µL | FN | 51 mm | 22 | LC | E | - |
| 80500 | 705N 50 µL SYR (22s/2"/2) | 004000 | 50 µL | FN | 50 mm | 25 | Bevel | O | 25 g needle |
| 80501 | 705LT 50 µL SYR | 004229 | 50 µL | F LT GT | - | - | - | O | GT |
| 80505 | 705NCH 50 µL SYR (22s/2"/2) | 004000 + 031930 | 50 µL | FN | 50 mm | 25 | Bevel | O | 25 g needle |
| 80521 | 705SN 50 µL SYR (22/2"/3) | 004300 | 50 µL | FN | 51 mm | 22 | LC | E | - |
| 80530 | 705RN 50 µL SYR (22s/2"/2) | 004050 | 50 µL | RN | 50 mm | 25 | Bevel | O | 25 g needle |
| 80539 | 705NPT5 50 µL SYR (22s/2"/5) | 004050 + 038410 | 50 µL | RN | 50 mm | - | Side hole | O | 25 g RN |
| 80565 | 705SNR 50 µL SYR (22s/2"/3) | 004300 | 50 µL | FN | 51 mm | 22 | LC | O | 22 g needle |
| 80600 | 710N 100 µL SYR (22s/2"/2) | 005000 | 100 µL | FN | 50 mm | 25 | Bevel | O | 25 g needle |
| 80601 | 710LT 100 µL SYR | 005229 | 100 µL | F LT GT | - | - | - | E | - |
| 80605 | 710NCH 100 µL SYR (22s/2"/2) | 005000 + 031930 | 100 µL | FN | 50 mm | 25 | Bevel | O | 25 g needle |
| 80621 | 710SN 100 µL SYR (22/2"/3) | 005300 | 100 µL | FN | 51 mm | 22 | LC | E | - |
| 80630 | 710RN 100 µL SYR (22s/2"/2) | 005050 | 100 µL | RN | 50 mm | 25 | Bevel | O | 25 g needle |
| 80639 | 710NPT5 100 µL SYR (22s/2"/5) | 005050 + 038410 | 100 µL | RN | 50 mm | 25 | Side hole | O | 25 g RN |
| 80665 | 710SNR 100 µL SYR (22s/2"/3) | 005300 | 100 µL | FN | 51 mm | 22 | LC | E | - |
| 80700 | 725N 250 µL SYR (22S/2"/2) | 006000 | 250 µL | FN | 50 mm | 25 | Bevel | O | 25 g needle |

| Hamilton part number | Part description and detail | Trajan part number | Volume | Termination | Needle length | Gauge | Needle tip | Equivalent or option | Variation |
|---|---|---|---|---|---|---|---|---|---|
| 80701 | 725LT 250 µL SYR | 006229 | 250 µL | F LT GT | - | - | - | O | GT |
| 80730 | 725RN 250 µL SYR (22s/2"/2) | 006050 | 250 µL | RN | 50 mm | 25 | Bevel | O | 25 g needle |
| 80739 | 725N 250 µL SYR (22S/2"/5) | 006050 + 038410 | 250 µL | RN | 50 mm | 25 | Side hole | O | 25 g RN |
| 80765 | 725NR 250 µL (22/2"/3) | 006300 | 250 µL | FN | 51 mm | 22 | LC | E | - |
| 80800 | 750N 500 µL SYR (22/2"/2) | 007000 | 500 µL | FN | 50 mm | 25 | Bevel | O | 25 g needle |
| 80801 | 750LT 500 µL SYR | 007229 | 500 µL | F LT GT | - | - | - | O | GT |
| 80830 | 750RN 500 µL SYR (22/2"/2) | 007050 | 500 µL | RN | 50 mm | 25 | Bevel | O | 25 g needle |
| 80839 | 750N 500 µL SYR (22/2"/5) | 007050 + 038410 | 500 µL | RN | 50 mm | 25 | Side hole | O | 25 g RN |
| 80865 | 750N 500 µL SYR (22/2"/3) | 007300 | 500 µL | FN | 51 mm | 22 | LC | E | - |
| 80900 | 1705N 50 µL SYR (22s/2"/2) | 004200 | 50 µL | FN | 50 mm | 25 | Bevel | O | 25 g needle |
| 80901 | 1705LT 50 µL SYR | 004229 | 50 µL | F LT GT | - | - | - | E | - |
| 80920 | 1705TLL 50 µL SYR | 004230 | 50 µL | F LL GT | - | - | - | E | - |
| 80922 | 1705TLLX 50 µL SYR | 004232 | 50 µL | F LL GT | - | - | - | E | - |
| 80927 | 1705TLL 50 µL SYR W/SLOTS | 004230 | 50 µL | F LL GT | - | - | - | E | - |
| 80930 | 1705RN 50 µL SYR (22s/2"/2) | 004250 | 50 µL | RN GT | 50 mm | 25 | Bevel | O | 25 g needle |
| 80938 | 1705RNW 50 µL SYR(25s/1.97"/3) | 004250 + 038260 | 50 µL | RN GT | 50 mm | 26 | LC (Waters) | O | 26 g needle |
| 80939 | 1705NPT5 50 µL SYR (22s/2"/5) | 004250 + 038410 | 50 µL | RN GT | 50 mm | 25 | Side hole | O | 25 g RN |
| 80956 | 1705SL 50 µL SYR (22s/2"/2) | 004279 | 50 µL | RN GT | 50 mm | 23 | Cone | O | 23 g cone tipped needle |
| 80962 | 1705CX 50 µL SYR W/STOP | 004995 | 50 µL | 1/4-28 UNF | - | - | - | E | - |
| 80965 | 1705RNR 50 µL SYR (22s/2"/3) | 004312 | 50 µL | RN GT | 51 mm | 22 | LC | O | 22 g needle |
| 80975 | 1705N 50 µL SYR (22s/2"/3) | 004312 | 50 µL | RN GT | 51 mm | 22 | LC | O | 22 g RN |
| 80985 | 1705N 50 µL SYR (22/2"/3) | 004312 | 50 µL | RN GT | 51 mm | 22 | LC | O | RN |
| 81000 | 1710N 100 µL SYR (22s/2"/2) | 005200 | 100 µL | FN | 50 mm | 25 | Bevel | O | 25 g needle |
| 81001 | 1710LT 100 µL SYR | 005229 | 100 µL | F LT GT | - | - | - | E | - |
| 81020 | 1710TLL 100 µL SYR | 005230 | 100 µL | F LL GT | - | - | - | E | - |
| 81022 | 1710TLLX 100 µL SYR | 005232 | 100 µL | F LL GT | - | - | - | E | - |
| 81027 | 1710TLL 100 µL SYR W/SLOTS | 005230 | 100 µL | F LL GT | - | - | - | E | - |
| 81030 | 1710RN 100 µL SYR (22s/2"/2) | 005250 | 100 µL | RN GT | 50 mm | 25 | Bevel | O | 25 g needle |
| 81038 | 1710RNW 100 µL SYR (25s/1.97"/3) | 005250 + 038260 | 100 µL | RN GT | 50 mm | 26s | LC (Waters) | O | 26s g needle |
| 81039 | 1710NPT5 100 µL SYR (22s/2"/5) | 005250 + 038410 | 100 µL | RN GT | 50 mm | 25 | Side hole | O | 25 g RN |
| 81056 | 1710SL 100 µL SYR (22s/2"/2) | 005279 | 100 µL | RN GT | 50 mm | 23 | Cone | O | 23 g cone tipped needle |
| 81060 | 1710C 100 µL SYR | 005990 | 100 µL | 1/4-28 UNF | - | - | - | O | With plunger stop |
| 81062 | 1710CX 100 µL SYR W/STOP | 005990 | 100 µL | 1/4-28 UNF | - | - | - | E | - |
| 81065 | 1710RNR 100 µL SYR (22s/2"/3) | 005312 | 100 µL | RN GT | 51 mm | 22 | LC | E | - |
| 81075 | 1710N 100 µL SYR (22s/2"/3) | 005312 | 100 µL | RN GT | 51 mm | 22 | LC | O | 22 g RN |
| 81085 | 1710N 100 µL SYR (22/2"/3) | 005312 | 100 µL | RN GT | 51 mm | 22 | LC | O | RN |
| 81100 | 1725LTN 250 µL SYR (22s/2"/2) | 006200 | 250 µL | FN | 50 mm | 25 | Bevel | O | Not LT, 25 g needle |
| 81101 | 1725LT 250 µL SYR | 006229 | 250 µL | F LT GT | - | - | - | E | - |
| 81120 | 1725TLL 250 µL SYR | 006230 | 250 µL | F LL GT | - | - | - | E | - |
| 81122 | 1725TLLX 250 µL SYR | 006232 | 250 µL | F LL GT | - | - | - | E | - |
| 81127 | 1725TLL 250 µL SYR W/SLOTS | 006230 | 250 µL | F LL GT | - | - | - | E | - |
| 81130 | 1725RN 250 µL SYR (22s/2"/2) | 006250 | 250 µL | RN GT | 50 mm | 25 | Bevel | O | 25 g needle |
| 81138 | 1725RNW 250 µL SYR (25s/1.97"/3) | 006250 + 038260 | 250 µL | RN GT | 50 mm | 25 | LC (Waters) | E | - |
| 81139 | 1725LTN 250 µL SYR (22S/2"/5) | 006250 + 038410 | 250 µL | RN GT | 50 mm | 25 | Side hole | O | Not LT, 25 g RN |
| 81156 | 1725SL 250 µL SYR (22s/2"/2) | 006279 | 250 µL | RN GT | 50 mm | 23 | Cone | O | 23 g needle |
| 81162 | 1725CX 250 µL SYR W/STOP | 006995 | 250 µL | 1/4-28 UNF | - | - | - | E | - |
| 81165 | 1725RNR 250 µL SYR (22/2"/3) | 006312 | 250 µL | RN GT | 51 mm | 22 | LC | E | - |

| Hamilton part number | Part description and detail | Trajan part number | Volume | Termination | Needle length | Gauge | Needle tip | Equivalent or option | Variation |
|---|---|---|---|---|---|---|---|---|---|
| 81175 | 1725LTN 250 µL SYR (22S/2"/3) | 006312 | 250 µL | RN GT | 51 mm | 22 | LC | O | Not LT, 22 g RN |
| 81185 | 1725LTN 250 µL SYR (22/2"/3) | 006312 | 250 µL | RN GT | 51 mm | 22 | LC | O | Not LT, RN |
| 81201 | 1750LT 500 µL SYR | 007229 | 500 µL | FN LT GT | - | - | - | E | - |
| 81216 | 1750LTN 500 µL SYR (22/2"/3) | 007312 | 500 µL | RN GT | 51 mm | 22 | LC | O | Not LT, RN |
| 81217 | 1750LTN 500 µL SYR (22/2"/2) | 007200 | 500 µL | FN | 50 mm | 25 | Bevel | O | Not LT, 25 g needle |
| 81220 | 1750TLL 500 µL SYR | 007230 | 500 µL | FN LL GT | - | - | - | E | - |
| 81222 | 1750TLLX 500 µL SYR | 007232 | 500 µL | FN LL GT | - | - | - | E | - |
| 81227 | 1750TLL 500 µL SYR W/SLOTS | 007230 | 500 µL | FN LL GT | - | - | - | E | - |
| 81230 | 1750RN 500 µL SYR (22/2"/2) | 007250 | 500 µL | RN GT | 50 mm | 25 | Bevel | O | 25 g needle |
| 81243 | 1750LTNPT5 500 µL SYR (22/2"/5) | 005250 + 038410 | 500 µL | RN GT | 50 mm | 25 | Side hole | O | Not LT, 25 g needle |
| 81256 | 1750SL 500uL SYR (22/2"/2) | 007279 | 500 µL | RN GT | 50 mm | 23 | Cone | O | 23 g cone tipped needle |
| 81262 | 1750CX 500 µL SYR W/STOP | 007995 | 500 µL | 1/4-28 UNF | - | - | - | E | - |
| 81265 | 1750RNR 500 µL SYR (22/2"/3) | 007312 | 500 µL | RN GT | 51 mm | 22 | LC | E | - |
| 81301 | 1001LT 1.0 mL SYR | 008020 | 1 mL | F LT GT | - | - | - | E | - |
| 81316 | 1001LTN 1.0 mL SYR (22/2"/3) | 008105 | 1 mL | RN GT | 51 mm | 22 | LC | O | RN |
| 81317 | 1001LTN 1.0 mL SYR (22/2"/2) | 008102 | 1 mL | FN GT | 50 mm | 22 | Bevel | O | Not LT |
| 81318 | 1001LTNCH 1.0 mL SYR (22/2"/2) | 008102 | 1 mL | FN GT | 50 mm | 22 | Bevel | O | Not LT, WO adaptor |
| 81320 | 1001TLL 1.0 mL SYR | 008025 | 1 mL | F LL GT | - | - | - | E | - |
| 81324 | 1001TLLCH 1.0 mL SYR | 008025 | 1 mL | F LL GT | - | - | - | O | WO adaptor |
| 81327 | 1001TLL 1.0 mL SYR W/SLOTS | 008025 | 1 mL | F LL GT | - | - | - | E | - |
| 81330 | 1001RN 1.0 mL SYR (22/2"/2) | 008100 | 1 mL | RN GT | 50 mm | 23 | Bevel | O | 23 g needle |
| 81343 | 1001LTNPT5 1.0 mL SYR (22/2"/5) | 008100 + 039120 | 1 mL | RN GT | 50 mm | - | Side hole | O | Not LT, 23 g needle |
| 81356 | 1001SL 1.0 mL SYR (22/2"/2) | 008110 | 1 mL | RN GT | - | - | - | O | 23 g needle |
| 81360 | 1001C 1.0 mL SYR | 008185 | 1 mL | 1/4-28 UNF | - | - | - | | - |
| 81365 | 1001RNR 1.0 mL SYR (22/2"/3) | 008105 | 1 mL | RN GT | 51 mm | 22 | LC | E | - |
| 81401 | 1002LT 2.5 mL SYR | 008420 | 2.5 mL | F LT GT | - | - | - | E | - |
| 81403 | 1002LTCH 2.5 mL SYR | 008420 | 2.5 mL | F LT GT | - | - | - | O | WO adaptor |
| 81416 | 1002LTN 2.5 mL SYR (22/2"/3) | 008505 | 2.5 mL | RN GT | 51 mm | 22 | LC | O | Not LT, RN |
| 81417 | 1002LTN 2.5 mL SYR (22/2"/2) | 008502 | 2.5 mL | FN GT | 50 mm | 22 | Bevel | O | Not LT |
| 81418 | 1002LTNCH 2.5 mL SYR (22/2"/2) | 008502 | 2.5 mL | FN GT | 50 mm | 22 | Bevel | O | WO adaptor |
| 81420 | 1002TLL 2.5 mL SYR | 008425 | 2.5 mL | FN LL GT | - | - | - | E | - |
| 81424 | 1002TLLCH 2.5 mL SYR | 008425 | 2.5 mL | FN LL GT | - | - | - | O | WO adaptor |
| 81427 | 1002TLL 2.5 mL SYR W/SLOTS | 008425 | 2.5 mL | F LL GT | - | - | - | E | - |
| 81430 | 1002RN 2.5 mL SYR (22/2"/2) | 008500 | 2.5 mL | RN GT | 50 mm | 23 | Bevel | O | 23 g needle |
| 81443 | 1002LTNPT5 2.5 mL SYR (22/2"/5) | 008500 + 039120 | 2.5 mL | RN GT | 50 mm | 23 | Side hole | O | Not LT, 23 g FN |
| 81456 | 1002SL 2.5 mL SYR (22/2"/2) | 008510 | 2.5 mL | RN GT | - | 23 | - | O | 23 g needle |
| 81460 | 1002C 2.5 mL SYR | 008687 | 2.5 mL | 1/4-28 UNF | - | - | - | E | - |
| 81501 | 1005LT 5.0 mL SYR | 008760 | 5 mL | R LL GT | - | - | - | O | LL not LT |
| 81516 | 1005LTN 5 mL SYR (22/2"/3) | 008700 + 0315233 | 5 mL | RN GT | 50 mm | 22 | LC | O | Not LT, RN |
| 81517 | 1005LTN 5.0 mL SYR (22/2"/2) | 008700 | 5 mL | RN GT | 50 mm | 23 | Bevel | O | Not LT, 23 g needle |
| 81518 | 1005LTNCH 5.0 mL SYR (22/2"/2) | 008762 | 5 mL | F LL GT | - | - | - | O | Not LT, WO needle |
| 81520 | 1005TLL 5.0 mL SYR | 008762 | 5 mL | F LL GT | - | - | - | E | - |
| 81524 | 1005TLLCH 5.0 mL SYR | 008762 | 5 mL | F LL GT | - | - | - | O | WO adaptor |
| 81527 | 1005TLL 5 mL SYR W/SLOTS | 008762 | 5 mL | F LL GT | - | - | - | E | - |
| 81530 | 1005RN 5.0 mL SYR (22/2"/2) | 008700 | 5 mL | RN GT | 50 mm | 23 | Bevel | O | 23 g needle |
| 81560 | 1005C 5.0 mL SYR | 008787 | 5 mL | 1/4-28 UNF | - | - | - | E | - |
| 81601 | 1010LT 10.0 mL SYR | 008962 | 10 mL | F LL GT | - | - | - | O | LL not LT |
| 81610 | 1010W 10.0 mL (WATERS) SYR | 008962 | 10 mL | F LL GT | - | - | - | E | - |

| Hamilton part number | Part description and detail | Trajan part number | Volume | Termination | Needle length | Gauge | Needle tip | Equivalent or option | Variation |
|---|---|---|---|---|---|---|---|---|---|
| 81616 | 1010LTN 10 mL SYR (22/2"/3) | 008900 + 0315233 | 10 mL | RN GT | 50 mm | 22 | LC | O | Not LT, RN |
| 81617 | 1010LTN 10.0 mL SYR (22/2"/2) | 008900 | 10 mL | RN GT | 50 mm | 23 | Bevel | O | RN |
| 81618 | 1010LTNCH 10.0 mL SYR (22/2"/2) | 008962 | 10 mL | F LL GT | - | - | - | O | LL not LT, WO adaptor |
| 81620 | 1010TLL 10.0 mL SYR | 008962 | 10 mL | F LL GT | - | - | - | E | - |
| 81624 | 1010TLLCH 10.0 mL SYR | 008962 | 10 mL | F LL GT | - | - | - | O | WO adaptor |
| 81627 | 1010TLL 10 mL SYR W/SLOTS | 008962 | 10 mL | F LL GT | - | - | - | E | - |
| 81630 | 1010RN 10.0 mL SYR (22/2"/2) | 008900 | 10 mL | RN GT | 50 mm | 23 | Bevel | O | 23 g needle |
| 81660 | 1010C 10.0 mL SYR | 008987 | 10 mL | 1/4-28 UNF | - | - | - | E | - |
| 82017 | 1001.25LTN 1.25 mL SYR (22/2"/2) | 008502 | 2.5 mL | FN GT | 50 mm | 22 | Bevel | O | Not LT, 2.5 mL instead of 1.25 mL |
| 82520 | 1025TLL 25.0 mL SYR | 009463 | 25 mL | F LL GT | - | - | - | E | - |
| 82525 | 1025TLL W/O FL 25 mL SYR W/SLOT | 009463 | 25 mL | F LL GT | - | - | - | O | - |
| 82527 | 1025TLL 25 mL SYR W/SLOTS | 009463 | 25 mL | F LL GT | - | - | - | E | - |
| 84850 | 85N 5 µL SYR (26s/2"/2) | 001400 | 5 µL | FN | 50 mm | 26 | Bevel | O | 26 g needle |
| 84851 | 85RN 5 µL SYR (26s/2"/2) | 001450 | 5 µL | RN | 50 mm | 26 | Bevel | O | 26 g needle |
| 84852 | 801N 10 µL SYR (26s/2"/2) | 002400 | 10 µL | FN | 50 mm | 26 | Bevel | O | 26 g needle |
| 84853 | 801RN 10 µL SYR (26s/2"/2) | 002450 | 10 µL | RN | 50 mm | 26 | Bevel | O | 26 g needle |
| 85020 | 1050TLL 50.0 mL SYR | 009660 | 50 mL | R LL GT | - | - | - | E | - |
| 85027 | 1050TLL 50 mL SYR W/SLOTS | 009660 | 50 mL | R LL GT | - | - | - | E | - |
| 86020 | 1100TLL 100.0 mL SYR | 009760 | 100 mL | R LL GT | - | - | - | E | - |
| 86204 | 7101KHCH 1 µL SYR (22/2.75"/3) | 000553 | 1.0 µL | RN | 70 mm | 23 | Cone | O | 23 g cone tipped needle |
| 86207 | 7101KHWG 1 µL SYR (22/2.75"/3) | 000553 | 1.0 µL | RN | 70 mm | 23 | Cone | O | 23 g cone tipped needle |
| 86211 | 7101KH 1 µL SYR (22s/2.75"/2) | 000506 | 1.0 µL | RN | 70 mm | 23 | Bevel | O | 23 g needle |
| 86250 | 7000.5KH 0.5 µL SYR (25/2.75"/3) | 000310 | 0.5 µL | RN | 70 mm | 23 | Cone | O | 23 g cone tipped needle |
| 86252 | 7000.5KHCH .5 µL SYR(25/2.75/3) | 000355 | 0.5 µL | RN | 70 mm | 23 | Cone | O | 23 g cone tipped needle |
| 86254 | 7000.5KHWG .5 µL SYR(25/2.75/3) | 000355 | 0.5 µL | RN | 70 mm | 23 | Cone | O | 23 g cone tipped needle |
| 86259 | 7000.5KH 0.5 µL SYR (25/2.75"/2) | 000311 | 0.5 µL | RN | 70 mm | 23 | Bevel | O | 23 g needle |
| 86274 | 7000.5ASRN (26/1.71"/HP) | 000400 | 0.5 µL | RN | 42 mm | 26 | Cone | E | - |
| 86276 | 7000.5ASRN (23/1.71"/HP) | 000410 | 0.5 µL | RN | 42 mm | 23 | Cone | E | - |
| 86311 | S0500 0.5L SYR (TLL) | 009910 | 500 mL | F LL GT | - | - | - | E | - |
| 86312 | S1000 1.0L SYR (TLL) | 009920 | 1 L | F LL GT | - | - | - | E | - |
| 86313 | S1500 1.5L SYR (TLL) | 009930 | 2 L | F LL GT | - | - | - | O | 2 L |
| 86314 | S2000 2.0L SYR (TLL) | 009930 | 2 L | F LL GT | - | - | - | E | - |
| 86326 | 1025SL 25 mL SYR (22/2"/2) | 009472 | 25 mL | R LL GT | - | - | - | O | LL, WO needle |
| 86336 | 1050SL 50 mL SYR (22/2"/2) | 009670 | 50 mL | R LL GT | - | - | - | O | LL, WO needle |
| 86346 | 1100SL 100 mL SYR (22/2"/2) | 009770 | 100 mL | R LL GT | - | - | - | O | LL, WO needle |
| 87402 | 701RNFS 10 µL SYR (0.17 mm/10 cm/3) | 002050 + 037610 | 10 µL | RN | 100 mm | - | OC | E | - |
| 87404 | 1701RNFS 10 µL SYR (0.17 mm/10 cm/3) | 002250 + 037610 | 10 µL | RN GT | 50 mm | - | OC | E | - |
| 87900 | 75N 5 µL SYR (26s/2"/2) | 001000 | 5 µL | FN | 50 mm | 26 | Bevel | O | 26 g needle |
| 87919 | 75N 5 µL SYR (26s/2"/3) | 001301 | 5 µL | FN | 51 mm | 22s | LC | O | 22 g needle |
| 87930 | 75RN 5.0 µL SYR (26s/2"/2) | 001050 | 5 µL | RN | 50 mm | 26 | Bevel | O | 26 g needle |
| 87943 | 65RNR 5.0 µL SYR (22s/2"/3) | 001450 | 5 µL | RN | 50 mm | 26 | Bevel | O | 26 g bevel tipped needle |
| 87957 | 75ASRN 5 µL SYR (23s/1.71"/HP) | 001810 | 5 µL | FN | 42 mm | 23 | Cone | O | 23 g FN |
| 87958 | 75ASRN 5 µL SYR (26s/1.71"/HP) | 001800 | 5 µL | FN | 42 mm | 26 | Cone | O | 26 g FN |
| 87959 | 75ASRN SYR (23S/26S/1.71"/HP) | 001821 | 5 µL | FN | 42 mm | 23/26 | Cone | O | Dual gauge FN |
| 87987 | 75ASN 5 µL SYR (23s/1.71 "/HP) | 001810 | 5 µL | FN | 42 mm | 23 | Cone | O | 23 g needle |

| Hamilton part number | Part description and detail | Trajan part number | Volume | Termination | Needle length | Gauge | Needle tip | Equivalent or option | Variation |
|---|---|---|---|---|---|---|---|---|---|
| 87988 | 75ASN 5 µL SYR (26s/1.71"/HP) | 001800 | 5 µL | FN | 42 mm | 26 | Cone | O | 26 g needle |
| 87989 | 75ASN 5 µL SYR(26s/1.71"/HP) 6PK | 001804 | 5 µL | FN | 42 mm | 26 | Cone | O | 26 g needle |
| 87990 | 75ASN 5 µL SYR(23s/1.71"/HP) 6PK | 001814 | 5 µL | FN | 42 mm | 23 | Cone | O | 23 g needle |
| 87991 | 75ASN 5 µL SYR (23s/1.71"/2) | 001810 | 5 µL | FN | 42 mm | 23 | Cone | O | 23 g cone tipped needle |
| 87992 | 75ASN 5 µL SYR (26s/1.71"/2) | 001800 | 5 µL | FN | 42 mm | 26 | Cone | O | 26 g cone tipped needle |
| 87993 | 75ASN 5 µL SYR (23-26/1.71"/HP) | 001821 | 5 µL | FN | 42 mm | 23/26 | Cone | E | - |
| 87994 | 75ASN 5 µL 6/PK (23-26/1.71"/HP) | 001822 | 5 µL | FN | 42 mm | 23/26 | Cone | E | - |
| 88000 | 7105KH 5.0 µL SYR (24/2.75"/3) | 000802 | 5 µL | RN | 70 mm | 23 | Cone | O | 23 g cone tipped needle |
| 88004 | 7105KHCH 5.0 µL SYR (24/2.75"/3) | 000852 | 5 µL | RN | 70 mm | 23 | Cone | O | 23 g cone tipped needle |
| 88007 | 7105KHWG 5.0 µL SYR (24/2.75"/3) | 000852 | 5 µL | RN | 70 mm | 23 | Cone | O | 23 g cone tipped needle |
| 88011 | 7105KH 5.0 µL SYR (24/2.75"/2) | 000803 | 5 µL | RN | 70 mm | 23 | Bevel | O | 23 g needle |
| 88035 | 75ASN/PE SYR 5 µL 0.63 mm OD | 001954 | 5 µL | FN | 70 mm | 23 | Cone | O | Cone tipped needle |
| 88040 | 75ASN/PE SYR 5 µL 0.47 mm OD | 001953 | 5 µL | FN | 70 mm | 26 | Cone | O | Cone tipped needle |

*Every effort has been made to ensure the SGE and L-MARK branded equivalents and similar close options suggested here are suitable alternative products, however the appropriateness for individual applications must remain the responsibility of the user.*

# eVol XR syringes and accessories

## Product specifications and part numbers

## eVol syringes

eVol syringes are designed for use with the eVol XR digital analytical syringe.

### Accuracy of eVol syringes

| Syringe volume | 1 mL | 500 µL | 100 µL | 50 µL | 5 µL |
|---|---|---|---|---|---|
| At 100% (uncalibrated)* | ±0.7% | ±0.7% | ±0.7% | ±1.0% | ±1.0% |
| At 100% (calibrated)** | ±0.2% | ±0.2% | ±0.2% | ±0.2% | ±0.2% |
| At 10% (calibrated)*** | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±1.0% |

**Calibration factor of 1.0000 applied to handle.*
***Syringe and handle calibrated at full volume.*
****Syringe and handle calibrated at 10% of capacity. Accuracy based on the 10% dispensed volume closest to zero position.*

*Note: For best results when performing repeat dispense (one aspiration followed by multiple dispense steps) use a calibration factor of 1.0000.*

### Precision of eVol syringes

| Syringe volume | 1 mL | 500 µL | 100 µL | 50 µL | 5 µL |
|---|---|---|---|---|---|
| At 100% | ±0.3% | ±0.3% | ±0.4% | ±0.4% | ±0.5% |
| At 10% | ±0.6% | ±0.6% | ±0.7% | ±0.8% | ±1.0% |

### eVol and eVol MEPS syringes

| Syringe part number | Volume | Needle length (mm) | Needle gauge | Needle OD (mm) | Needle ID (mm) | Needle tip | Pack size | Replacement needle part number | Replacement plunger part number |
|---|---|---|---|---|---|---|---|---|---|
| **eVol gas tight syringes** | | | | | | | | | |
| 2910020 | 5 µL | 50 | 26s | 0.50 | 0.12 | Bevel | 1 | 036910 | 2910380 |
| 2910021 | 5 µL | - | - | - | - | - | 1 | - | 2910380 |
| 2910022 | 50 µL | 50 | 25 | 0.50 | 0.20 | Bevel | 1 | 038110 | 2910382 |
| 2910023 | 50 µL | - | - | - | - | - | 1 | - | 2910382 |
| 2910024 | 500 µL | 50 | 23 | 0.63 | 0.32 | Bevel | 1 | 039110 | 2910384 |
| 2910025 | 500 µL | - | - | - | - | - | 1 | - | 2910384 |
| 2910029 | 100 µL | 50 | 25 | 0.50 | 0.20 | Bevel | 1 | 038110 | 2910383 |
| 2910035 | 1 mL | 50 | 23 | 0.63 | 0.32 | Bevel | 1 | 039110 | 2910385 |
| 2910037 | 100 µL | - | - | - | - | - | 1 | - | 2910383 |
| 2910320 | 5 µL | 50 | 26s | 0.50 | 0.12 | Bevel | 3 | 036910 | 2910380 |
| 2910322 | 50 µL | 50 | 25 | 0.50 | 0.20 | Bevel | 3 | 038110 | 2910382 |
| 2910324 | 500 µL | 50 | 23 | 0.63 | 0.32 | Bevel | 3 | 039110 | 2910384 |
| 2910329 | 100 µL | 50 | 25 | 0.50 | 0.20 | Bevel | 3 | 038110 | 2910383 |
| 2910335 | 1 mL | 50 | 23 | 0.63 | 0.32 | Bevel | 3 | 039110 | 2910385 |
| **eVol MEPS gas tight syringes** | | | | | | | | | |
| 2910026 | 500 µL | - | - | - | - | - | 1 | - | 2910384 |
| 2910027 | 50 µL | - | - | - | - | - | 6 | - | 2910382 |
| 2910028 | 100 µL | - | - | - | - | - | 6 | - | 2910383 |

### eVol XR accessories

| Part number | Part description and detail |
|---|---|
| **eVol accessories** | |
| 2910010 | eVol stand (acrylic) |
| 2910012 | eVol charger |
| 2910030 | eVol charging stand |
| 2910040 | eVol replacement battery |

# MEPS®

**MEPS® is microextraction by packed sorbent, the miniaturization of conventional SPE (solid phase extraction) packed bed devices from milliliter bed volumes to microliter volumes.**

The MEPS approach to sample preparation is suitable for reversed phase, normal phase, mixed mode or ion exchange chemistries.

**MEPS advantages over conventional SPE:**

Less sample required giving you greater flexibility when you have small sample quantities.

- Less solvent used means less solvent waste and ultimately reduced expense.
- Faster preparation time, reducing from hours to minutes for improved laboratory workflow.


MEPS incorporates packed phase in a micro-cartridge or BIN (barrel insert and needle) which is then integrated into an SGE analytical syringe to make miniaturized SPE possible. With MEPS, the sample processing, extraction and injection steps are performed using the same syringe.

## Configuration for MEPS

MEPS BINs are available for use with eVol MEPS syringes, with a range of packing material phases.

- MEPS BINs can be used with 50 µL, 100 µL and 500 µL eVol MEPS syringes.
- LC needles are 55.5 mm in length, 22 gauge and LC tipped.
- GC needles are 55.5 mm in length, 23 gauge and cone tipped.

### MEPS BINs

| Part number | MEPS phase | Needle length (mm) | Needle gauge | Needle OD (mm) | Needle ID (mm) | Needle tip | Pack size |
|---|---|---|---|---|---|---|---|
| MEPS barrel insert and needle (BIN) for LC applications | | | | | | | |
| 2900701 | C18 | 55.5 | 22 | 0.72 | 0.17 | LC | 5 |
| 2900702 | C8 | 55.5 | 22 | 0.72 | 0.17 | LC | 5 |
| 2900703 | APS | 55.5 | 22 | 0.72 | 0.17 | LC | 5 |
| 2900705 | HVDB | 55.5 | 22 | 0.72 | 0.17 | LC | 5 |
| 2900706 | SDVB | 55.5 | 22 | 0.72 | 0.17 | LC | 5 |
| 2900707 | C2 | 55.5 | 22 | 0.72 | 0.17 | LC | 5 |
| MEPS barrel insert and needle (BIN) for GC applications | | | | | | | |
| 2900711 | C18 | 55.5 | 23 | 0.63 | 0.14 | Cone | 5 |
| 2900712 | C8 | 55.5 | 23 | 0.63 | 0.14 | Cone | 5 |
| 2900713 | APS | 55.5 | 23 | 0.63 | 0.14 | Cone | 5 |
| 2900715 | HVDB | 55.5 | 23 | 0.63 | 0.14 | Cone | 5 |
| 2900716 | SDVB | 55.5 | 23 | 0.63 | 0.14 | Cone | 5 |
| 2900717 | C2 | 55.5 | 23 | 0.63 | 0.14 | Cone | 5 |

# Notes

# Notes

# Notes

For more information about this product
visit www.trajanscimed.com or contact
techsupport@trajanscimed.com

*Specifications are subject to change without notice.*

*Analytical syringes manufactured by Trajan Scientific and Medical are intended for analytical and laboratory use only and are not intended or approved for use with food, including the production or packaging of food, nor medical or human in-vivo use.*

# Syringes for the laboratory


1974 MICROCOLUMN 50 2024



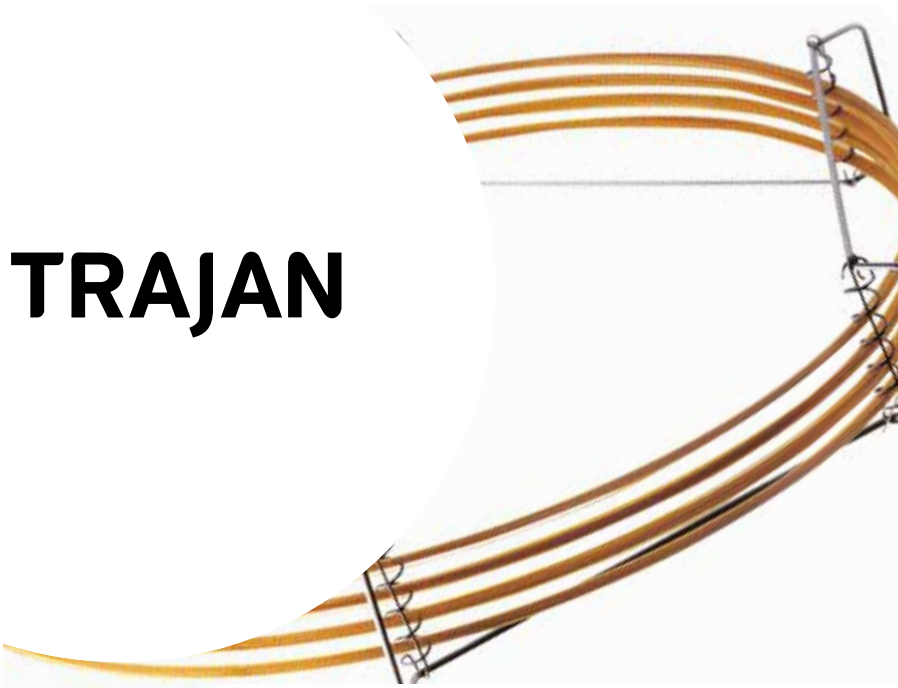
TRAJAN

www.trajanscimed.com





# TRAJAN








## GC consumables

1974 MICROCOLUMN 50 2024

TRAJAN

In the laboratory today, the time spent and the precision required for sample preparation are key investments in an efficient workflow. Having spent that time and effort in sample preparation, it then becomes critical to maintain the integrity of the sample as it is delivered to the separation and detection steps of the analysis. This is why Trajan Scientific and Medical (Trajan) is focussed on delivering a portfolio of high performance GC Inlet liners, GC columns, connections and fittings all with the specific and aggregate intent of ensuring the sample is not compromised on its journey to the detection system.

Our portfolio is built on the strength and world class heritage of the SGE GC supplies portfolio. In each of our manufacturing operations around the world, our products are built to exacting standards so that you can rely on their performance, accuracy and precision.

With a strong team of design chemists and production engineers, and an extensive network of application based industry opinion leaders, our portfolio of GC consumables continues to develop within Trajan. This means you, as a user in the laboratory, are assured of your sample integrity through collection, injection, separation and detection, optimizing your analysis.

We are confident that in this selection guide you will be able to identify and select the correct consumables for your application. If not, please contact us and we can investigate a custom solution for you.

As a major provider of tools and components for the analytical industry, Trajan is manufacturing product in the USA, Malaysia and Australia and we continue to service our valued customers around the world via a connected group of commercial and distribution facilities in Europe, the Americas, Asia and Australia. This supply chain is ably supported by a strong field technical team around the world.

# Contents

## SGE Syringes

*Please refer to the Syringes for the laboratory brochure.*

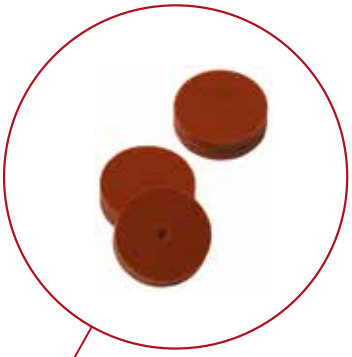
## SGE Inlet liners

| Color | Injection technique | Sample types | Liner geometry |
|---|---|---|---|
| Dark green | Splitless | • Trace level analyses<br>• Active compounds | Taper/gooseneck |
| Blue | Split | • General purpose<br>• Concentrated samples<br>• Dirty samples | FocusLiner® |
| Aqua | Splitless | • Trace level analyses<br>• Dirty samples<br>• Wide boiling point range | Tapered FocusLiner |
| Orange | Direct | • Trace level analyses<br>• Active compounds | ConnecTite™ |
| Purple | Split/ splitless | • General purpose<br>• Concentrated samples<br>• Dirty samples (only if quartz wool is present)<br>• Gaseous samples (also purge and trap, headspace) | Straight |
| Yellow | Splitless LVI | • Trace level analyses<br>• Low boiling point compounds<br>• Active compounds | Double taper |
| Gray | PTV LVI | • Trace level analyses<br>• Large volume injections | PTV/LVI |

## Connectors and ferrules

SilTite®

| Material | Uses | Advantages | Limitations |
|---|---|---|---|
| 100% Graphite | FID, NPD, high temperature | • Easy-to-use stable seal<br>• Higher temperature limit<br>• Easily removed<br>• Reusable | • Not for MS or oxygen-sensitive detectors<br>• Soft, easily deformed or destroyed<br>• Possible system contamination |
| 15% Graphite/ 85% Vespel® | MS and oxygen-sensitive detectors | • Long lifetime<br>• High temperature limit<br>• MS compatible | • Cannot be re-used<br>• Must be re-tightened after initial temperature cycles |
| SilTite® metal | MS and oxygen-sensitive detectors | • Long lifetime<br>• High temperature limit<br>• MS compatible | • Cannot be re-used |



## Septa

| Material | Max operating temperature | Key features |
|---|---|---|
| GP grade | 275°C* | Low temperature applications |
| EC grade | 350°C* | Low bleed |
| MN grade | 350°C* | Premium septa for autosamplers |
| HT grade | 400°C* | Outstanding mechanical properties for the highest temperature applications |

**Temperature for 11 mm septa only.*

## SGE GC columns

| Column parameter | Parameters affecting resolution | | | Performance changes |
|---|---|---|---|---|
| | Efficiency | Retention | Selectivity | |
| Column length (m) | ✓ | | | Doubling column length increases resolution by ~40% |
| Internal diameter (mm) | ✓ | ✓ | | The smaller the column ID, the greater the efficiency and better the resolution |
| Film thickness (µm) | | ✓ | | The thicker the film, the greater the retention, e.g. ideal for highly volatile compounds. The thinner the film, the sharper the peaks and lower the bleed |
| Stationary phase chemistry | | | ✓ | Altering the stationary phase can affect elution order and help separate closely, or co-eluting peaks |

## SilFlow®

3 port, 4 port or Deans' switch configuration microchannel devices for multidimensional analysis.

# Septa

## Low bleed | Long lifetime

The purpose of a septa in a GC system is to isolate the sample flow path from the outside world. The septa provides a barrier that is readily penetrated by the injector needle whilst maintaining internal pressure without causing system contamination. An ideal septa has low bleed and a long lifetime.

## Septa selection

| | GP grade | EC grade | MN grade | HT grade | Enduro blue |
|---|---|---|---|---|---|
| |  |  |  |  |  |
| | • Low temperature applications. | • Combines significantly longer injection life, low bleed and low injection port adhesion. | • Premium septa for autosamplers.<br>• Up to 400 injections per septa.<br>• Pre-pierced to reduce coring. | • Bleed and temperature optimized, combined with outstanding mechanical properties for the highest temperature applications.<br>• Retains softness and pierceability at high temperatures, and low injection port adhesion. | • For Shimadzu GCs. |
| Material | Silicone | High temperature silicone | High temperature silicone | BTO silicone | High temperature silicone |
| Durability | Good | Excellent | Excellent | Excellent | Excellent |
| Resealing | Good | Excellent | Excellent | Excellent | Excellent |
| Solvent resistance | Excellent | Excellent | Excellent | Excellent | Excellent |
| Tear resistance | Good | Excellent | Excellent | Excellent | Excellent |
| Maximum temperature | 275°C* | 350°C* | 350°C* | 400°C* | 350°C |

*Temperature for 11 mm septa only.

**Why septa should be replaced regularly:**

- Avoid decomposition in GC inlet
- Prolong column lifetime
- Avoid system leaks and sample loss

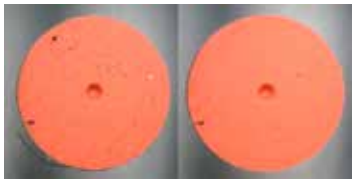
*Examples of worn septa.*

## Heat stability and sticking

All EC, MN and HT grade septa are treated with a non-stick coating:

- Reduces sticking in the injection port
- Improves ease of replacement
- Prevents dust accumulation on the surface
- Reduces potential causes of leaks and contamination

*Coated MN septa after exposing to dust and wiping.*



*Uncoated MN septa after exposing to dust and wiping.*

## Septa for Agilent instruments

| Diameter (mm) | Type | Pack size | Part number |
|---|---|---|---|
| For Agilent 7890, 6890, 6850, 5890 and 4890 | | | |
| 11 | GP | 50 | 041826 |
| 11 | EC | 25 | 041902 |
| 11 | MN | 50 | 041856 |
| 11 | HT | 25 | 041898 |

## Septa for PerkinElmer instruments

| Diameter (mm) | Type | Pack size | Part number |
|---|---|---|---|
| For PerkinElmer Autosystem, Clarus 500, 600, 590 and 690 | | | |
| 11 | GP | 50 | 041826 |
| 11 | EC | 25 | 041902 |
| 11 | MN | 50 | 041856 |
| 11 | HT | 25 | 041898 |

## Septa for Shimadzu instruments

| Style | Type | Pack size | Part number |
|---|---|---|---|
| For Shimadzu GC-2030, GC-2014, GC-2010 and GC-17A | | | |
| Plug | Enduro blue | 50 | 041890 |
| Plug | EC | 50 | 041905 |
| Plug | HT | 50 | 041895 |

## Septa for Thermo Scientific instruments

| Diameter (mm) | Type | Pack size | Part number |
|---|---|---|---|
| For Thermo Scientific TRACE 1300 series GC† | | | |
| 11 | GP | 50 | 041826 |
| 11 | EC | 25 | 041902 |
| 11 | MN | 50 | 041856 |
| 11 | HT | 25 | 041898 |

*†Contact us for 17 mm septa part numbers for previous Thermo Scientific instruments.*

## Confidence in your analysis

The purpose of an inlet liner in a GC system is to allow a sample injected in the liquid phase to pass into the gaseous phase and onto the GC column.

The elevated temperature used in the GC inlet vaporizes the liquid sample into a gaseous sample for transfer to the GC column.

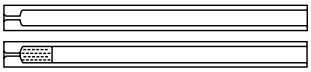
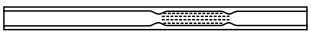
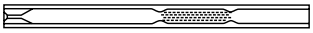
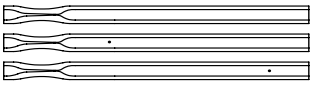
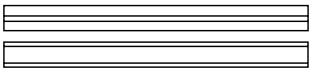
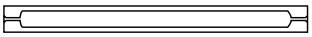
During the transition from a liquid to a gas, there is change in the volume and the liner must be able to contain this volume.

If the volume is too large, sample is lost, impacting reproducibility and sensitivity.


**Important considerations when selecting inlet liners:**

- Must ensure complete vaporization of the sample before it reaches the column entrance.
- Must not react with the sample.
- The liner volume must be larger than the volume of vaporized sample.
- The liner should minimize discrimination not promote it.
- Adding quartz wool increases the surface area and promotes mixing.
- Inlet liners should be deactivated, especially for analysis of polar solutes and for splitless injections.
- Wool should be placed in the optimum position.

# Liner selection guide

| Color | Injection technique | Sample types | Liner geometry | How the Geometry Works |
|---|---|---|---|---|
| Dark green | Splitless | • Trace level analyses<br>• Active compounds | Taper/gooseneck  | • A bottom taper focuses sample onto the head of the column and minimizes sample contact with metal parts of the inlet.<br>• Remember – the addition of quartz wool to your inlet liner promotes mixing of analytes, aids the vaporization of liquid samples, and works as a trap to collect non-volatile residue in the sample (i.e. protects capillary column from 'dirty' samples). |
| Blue | Split | • General purpose<br>• Concentrated samples<br>• Dirty samples | FocusLiner  | • Ensures quartz wool remains in the correct position in the liner.<br>• Excellent reproducibility results from the wiping of the sample from the syringe needle and the prevention of droplet formation.<br>• Minimizes high molecular weight discrimination. |
| Aqua | Splitless | • Trace level analyses<br>• Dirty samples<br>• Wide boiling point range | Tapered FocusLiner  | • Bottom taper focuses sample onto the head of the column and minimizes contact with metal parts of the inlet.<br>• Ensures quartz wool remains in the correct position in the liner.<br>• Excellent reproducibility results from the wiping of the sample from the syringe needle and the prevention of droplet formation. |
| Orange | Direct | • Trace level analyses<br>• Active compounds | ConnecTite  | • ConnecTite liners facilitate maximum transfer of sample to the GC column and inhibit sample degradation due to hot metal components inside the inlet.<br>• Systems equipped with electronic pressure control require a hole in the liner body to maintain system gas flows.<br>• ConnecTite liners that have a hole near the bottom are best suited to analyses where a tailing solvent peak could affect early eluting compounds. ConnecTite liners with a hole at the top of the liner will improve your analysis with aqueous injections or where compounds of interest elute away from the solvent peak. |
| Purple | Split/splitless | • General purpose<br>• Concentrated samples<br>• Dirty samples (only if quartz wool is present)<br>• Gaseous samples (also purge and trap, headspace) | Straight  | • Straight liners facilitate higher split flows.<br>• Narrow bore straight liners facilitate fast GC work.<br>• Small injection volumes of less than 0.5 µL are best used with a narrow bore.<br>• Narrow bore straight liners improve focussing of gaseous samples (purge, trap and headspace). |
| Yellow | Splitless<br>LVI | • Trace level analyses<br>• Low boiling point compounds<br>• Active compounds | Double taper  | • Bottom taper minimizes contact with metal parts of the inlet and focuses sample onto the head of the column.<br>• Top taper aids in minimizing sample flashback. |
| Gray | PTV<br>LVI | • Trace level analyses<br>• Large volume injections | PTV/LVI  | • PTV and LVI liners generally have sintered glass beads or powder to increase the surface area and trap nonvolatile residue.<br>• PTV liners use baffles or a wisp of quartz wool to aid in vaporization of samples and retain droplets during low temperature injections.<br>• Side hole needles are recommended for these techniques to ensure effective distribution of sample within the liner. |

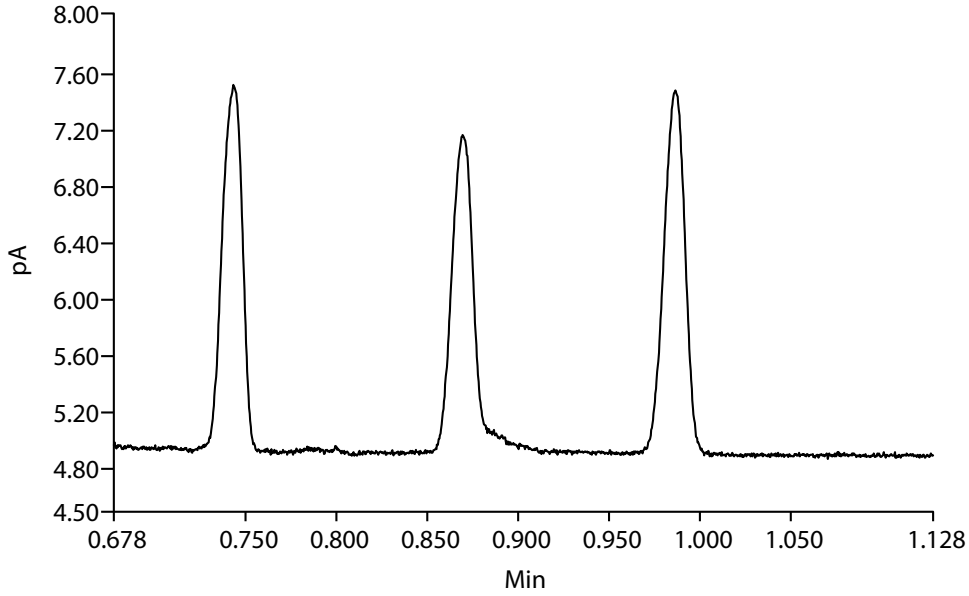
# Inlet liner volume


The volume of the vaporized sample should not exceed half of the total volume of the liner. Expansion volumes of solvents need to be understood to calculate injection volume. Solvents with low densities enable more volume of solvent to be injected into the GC system.

To demonstrate this, acetonitrile was injected onto a split straight liner with volume of 986 µL.

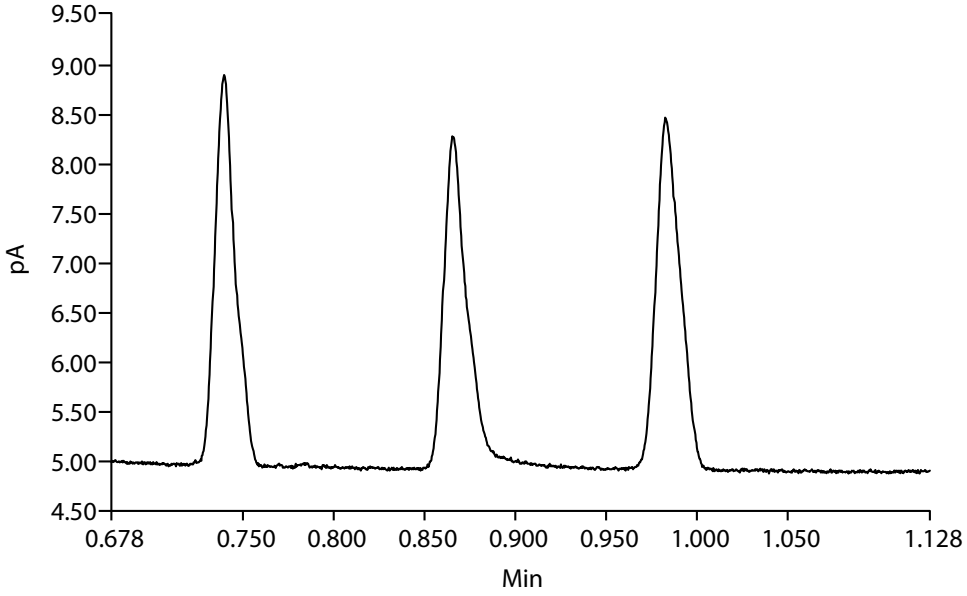
### Comparison of injection volume

#### 1 µL injection




*1 µL expands to 432 µL: Good peak shape, but approaching limits of half total liner volume.*

#### 2 µL injection




*2 µL expands to 864 µL: Peak shape distorted as vapor exceeded half of liner volume.*

# Liner deactivation

Deactivation is carried out at a temperature >400°C which is hotter than injection port temperatures. This ensures no thermal breakdown of the deactivation under normal injection operating conditions.

Deactivation of liners with wool in situ means there is no handling of the wool after deactivation. Manual handling of wool can cause fracturing which can lead to active sites.

Proprietary deactivation reagent ensures stability of deactivation and excellent lifetime.

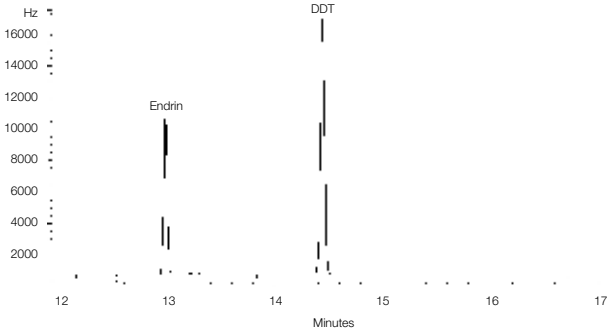

### Liner comparison of Endrin and DDT% breakdown

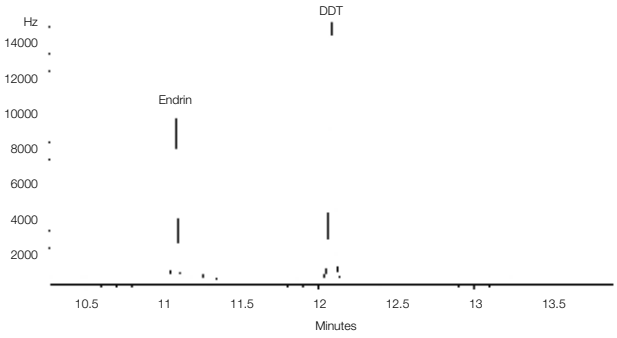
If the Endrin or DDT breakdown is 3% or higher it fails.

| Competitor | |
|---|---|
| Endrin Deg% | 3.23 |
| DDT Deg% | 1.95 |

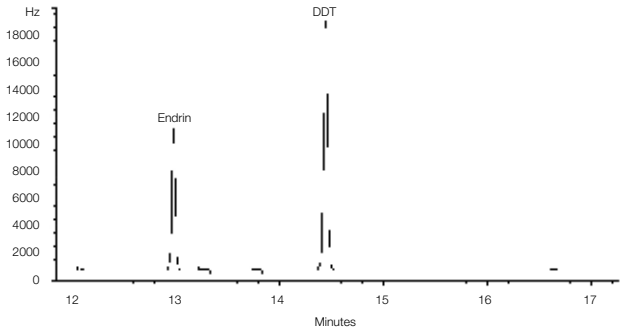
| SGE FocusLiner | |
|---|---|
| Endrin Deg% | 1.33 |
| DDT Deg% | 0.83 |

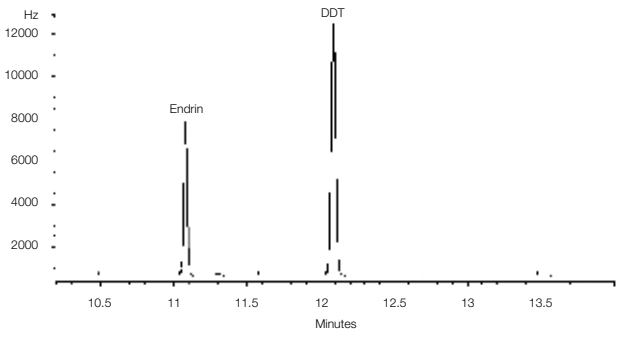
### Competitor liner




### SGE FocusLiner



## SGE Inlet liners

| Description and geometry sketch | OD (mm) | ID (mm) | Length (mm) | Pack size | Part number |
|---|---|---|---|---|---|
| **For Agilent 7890, 6890, 6850, 5890 and 4890** | | | | | |
| Split/splitless FocusLiner | 6.3 | 4 | 78.5 | 5 | 092002 |
| | | | | 25 | 092219 |
| Split/splitless tapered FocusLiner | 6.3 | 4 | 78.5 | 5 | 092003 |
| | | | | 25 | 092011 |
| Split/splitless FAST FocusLiner | 6.3 | 2.3 | 78.5 | 5 | 092005 |
| | | | | 25 | 092008 |
| Split/splitless tapered FAST FocusLiner | 6.3 | 2.3 | 78.5 | 5 | 092111 |
| | | | | 25 | 092115 |
| ConnecTite liner standard | 6.3 | 4 | 78.5 | 5 | 092324 |
| ConnecTite liner top hole | 6.3 | 4 | 78.5 | 5 | 092325 |
| ConnecTite liner bottom hole | 6.3 | 4 | 78.5 | 5 | 092326 |
| Split, straight-through liner | 6.3 | 4 | 78.5 | 5 | 092007 |
| | | | | 25 | 092222 |
| Split (quartz wool) | 6.3 | 4 | 78.5 | 5 | 092001 |
| | | | | 25 | 092220 |
| Split/splitless with single taper | 6.3 | 4 | 78.5 | 5 | 092017 |
| | | | | 25 | 092229 |
| Split/splitless with single taper (quartz wool) | 6.3 | 4 | 78.5 | 5 | 092019 |
| | | | | 25 | 092218 |
| Split/splitless with double taper | 6.3 | 4 | 78.5 | 5 | 092018 |
| | | | | 25 | 092230 |
| Direct, straight-through liner | 6.3 | 1.2 | 78.5 | 5 | 092016 |
| | | | | 25 | 092224 |
| Split/splitless quartz, straight-through liner | 6.1 | 2 | 78.5 | 5 | 092004 |
| Splitless with recessed gooseneck | 6.3 | 2 | 78.5 | 5 | 092013 |
| Split/splitless recessed gooseneck (quartz wool) | 6.3 | 4 | 78.5 | 5 | 092010 |

- Taper/gooseneck
- FocusLiner
- Tapered FocusLiner
- ConnecTite
- Straight
- Double taper
- PTV/LVI

## O-rings and sealing rings

| Description | Usage | Pack size | Part number |
|---|---|---|---|
| **For Agilent 7890, 6890, 6850, 5890 and 4890** | | | |
| O-ring | Temperatures up to 300°C. Suitable for inlet liners with OD of 6.3 mm | 10 | 0726532 |
| Graphite sealing ring | Temperatures up to 450°C. Suitable for inlet liners with OD of 6.3 mm | 10 | 0726005 |
| Graphite sealing ring | Temperatures up to 450°C. Suitable for use with inlet liners 092004 | 10 | 0726006 |

## SGE Inlet liners

| Description and geometry | | OD (mm) | ID (mm) | Length (mm) | Pack size | Part number |
|---|---|---|---|---|---|---|
| **For PerkinElmer Clarus 590 and 690** | | | | | | |
| Split/splitless FocusLiner | | 6.3 | 4 | 78.5 | 5 | 092002 |
| | | | | | 25 | 092219 |
| Split/splitless tapered FocusLiner | | 6.3 | 4 | 78.5 | 5 | 092003 |
| | | | | | 25 | 092011 |
| Split/splitless FAST FocusLiner | | 6.3 | 2.3 | 78.5 | 5 | 092005 |
| | | | | | 25 | 092008 |
| Split/splitless tapered FAST FocusLiner | | 6.3 | 2.3 | 78.5 | 5 | 092111 |
| | | | | | 25 | 092115 |
| ConnecTite Liner standard | | 6.3 | 4 | 78.5 | 5 | 092324 |
| ConnecTite Liner top hole | | 6.3 | 4 | 78.5 | 5 | 092325 |
| ConnecTite Liner bottom hole | | 6.3 | 4 | 78.5 | 5 | 092326 |
| Split, straight-through liner | | 6.3 | 4 | 78.5 | 5 | 092007 |
| | | | | | 25 | 092222 |
| Split (quartz wool) | | 6.3 | 4 | 78.5 | 5 | 092001 |
| | | | | | 25 | 092220 |
| Split/splitless with single taper | | 6.3 | 4 | 78.5 | 5 | 092017 |
| | | | | | 25 | 092229 |
| Split/splitless with single taper (quartz wool) | | 6.3 | 4 | 78.5 | 5 | 092019 |
| | | | | | 25 | 092218 |
| Split/splitless with double taper | | 6.3 | 4 | 78.5 | 5 | 092018 |
| | | | | | 25 | 092230 |
| Direct, straight-through liner | | 6.3 | 1.2 | 78.5 | 5 | 092016 |
| | | | | | 25 | 092224 |
| Split/splitless quartz, straight-through liner | | 6.1 | 2 | 78.5 | 5 | 092004 |
| Splitless with recessed gooseneck | | 6.3 | 2 | 78.5 | 5 | 092013 |
| Split/splitless recessed gooseneck (quartz wool) | | 6.3 | 4 | 78.5 | 5 | 092010 |
| | | | | | 25 | 092223 |

- Taper/gooseneck
- FocusLiner
- Tapered FocusLiner
- ConnecTite
- Straight
- Double taper
- PTV/LVI

## O-rings and sealing rings

| Description | Usage | Pack size | Part number |
|---|---|---|---|
| **For PerkinElmer Clarus 590 and 690** | | | |
| O-ring | Temperatures up to 300°C. Suitable for inlet liners with OD of 6.3 mm | 10 | 0726532 |
| Graphite sealing ring | Temperatures up to 450°C. Suitable for inlet liners with OD of 6.3 mm | 10 | 0726005 |
| Graphite sealing ring | Temperatures up to 450°C. Suitable for use with inlet liners 092004 | 10 | 0726006 |

## SGE Inlet liners

| Description and geometry sketch | OD (mm) | ID (mm) | Length (mm) | Pack size | Part number |
|---|---|---|---|---|---|
| **For Shimadzu GC-2030 (SPL injector), GC-2010 (SPL-2010 Injector), GC-2014 (SPL-2014 injector) and GC-17A (SPL-17 injector)** | | | | | |
| Split/splitless FocusLiner (top of wool 25 mm) | 5 | 3.4 | 95 | 5 | 092059* |
| Split/splitless tapered FocusLiner (top of wool 25 mm) | 5 | 3.4 | 95 | 5 | 092058 |
| Split/splitless FocusLiner (top of wool 15 mm) | 5 | 3.4 | 95 | 5 | 092062 |
| Split/splitless tapered FocusLiner (top of wool 15 mm) | 5 | 3.4 | 95 | 5 | 092068 |
| ConnecTite liner standard | 5 | 3.4 | 95 | 5 | 092329 |
| ConnecTite liner top hole | 5 | 3.4 | 95 | 5 | 092330 |
| ConnecTite liner bottom hole | 5 | 3.4 | 95 | 5 | 092331 |
| Split, straight-through liner | 5 | 3.4 | 95 | 5 | 092064 |
| Splitless, straight-through liner | 5 | 2.6 | 95 | 5 | 0920861 |
| Split/splitless with single taper | 5 | 3.4 | 95 | 5 | 092071 |
| Split/splitless with middle gooseneck | 5 | 3.4 | 95 | 5 | 092077 |
| Split/splitless with recessed gooseneck and quartz wool | 5 | 3.4 | 95 | 5 | 092061 |
| Split/splitless with middle gooseneck | 5 | 3.4 | 95 | 5 | 092085 |
| ConnecTite (0.53 mm ID columns) | 5 | 2.6 | 95 | 5 | 092087 |
| SPME liner | 5 | 0.75 | 95 | 5 | 092089 |

** When using a standard 42 mm needle for autosamplers, the sample will be injected on top of the wool for this liner.*

- Taper/gooseneck
- FocusLiner
- Tapered FocusLiner
- ConnecTite
- Straight
- Double taper
- PTV/LVI

## O-rings and sealing rings

| Description | Usage | Pack size | Part number |
|---|---|---|---|
| O-ring | For GC-2030 (SPL-2030 injector), GC-2014 (SPL-2014 injector) and GC-2010 (SPL-2010 injector) | 10 | 0726533 |
| Graphite sealing ring | Temperatures up to 450°C. For GC-17A (SPL-17 injector) | 10 | 0726007 |

## SGE Inlet liners

| Description and geometry | OD (mm) | ID (mm) | Length (mm) | Pack size | Part number |
|---|---|---|---|---|---|
| **For Thermo Scientific TRACE 1300 series GC** | | | | | |
| Split/splitless FocusLiner | 6.3 | 4 | 78.5 | 5 | 092002 |
| | | | | 25 | 092219 |
| Split/splitless tapered FocusLiner | 6.3 | 4 | 78.5 | 5 | 092003 |
| | | | | 25 | 092011 |
| Split/splitless FAST FocusLiner | 6.3 | 2.3 | 78.5 | 5 | 092005 |
| | | | | 25 | 092008 |
| Split/splitless tapered FAST FocusLiner | 6.3 | 2.3 | 78.5 | 5 | 092111 |
| | | | | 25 | 092115 |
| ConnecTite Liner standard | 6.3 | 4 | 78.5 | 5 | 092324 |
| ConnecTite Liner top hole | 6.3 | 4 | 78.5 | 5 | 092325 |
| ConnecTite Liner bottom hole | 6.3 | 4 | 78.5 | 5 | 092326 |
| Split, straight-through liner | 6.3 | 4 | 78.5 | 5 | 092007 |
| | | | | 25 | 092222 |
| Split (quartz wool) | 6.3 | 4 | 78.5 | 5 | 092001 |
| | | | | 25 | 092220 |
| Split/splitless with single taper | 6.3 | 4 | 78.5 | 5 | 092017 |
| | | | | 25 | 092229 |
| Split/splitless with single taper (quartz wool) | 6.3 | 4 | 78.5 | 5 | 092019 |
| | | | | 25 | 092218 |
| Split/splitless with double taper | 6.3 | 4 | 78.5 | 5 | 092018 |
| | | | | 25 | 092230 |
| Direct, straight-through liner | 6.3 | 1.2 | 78.5 | 5 | 092016 |
| | | | | 25 | 092224 |
| Split/splitless quartz, straight-through liner | 6.1 | 2 | 78.5 | 5 | 092004 |
| Splitless with recessed gooseneck | 6.3 | 2 | 78.5 | 5 | 092013 |
| Split/splitless recessed gooseneck (quartz wool) | 6.3 | 4 | 78.5 | 5 | 092010 |
| | | | | 25 | 092223 |

- Taper/gooseneck
- FocusLiner
- Tapered FocusLiner
- ConnecTite
- Straight
- Double taper
- PTV/LVI

## O-rings and sealing rings

| Description | Usage | Pack size | Part number |
|---|---|---|---|
| **For Thermo Scientific TRACE 1300 series GC** | | | |
| O-ring | Temperatures up to 300°C. Suitable for inlet liners with OD of 6.3 mm | 10 | 0726532 |
| Graphite sealing ring | Temperatures up to 450°C. Suitable for inlet liners with OD of 6.3 mm | 10 | 0726005 |
| Graphite sealing ring | Temperatures up to 450°C. Suitable for use with inlet liners 092004 | 10 | 0726006 |

# Connectors and ferrules

## Easy to install | Leak free | Stable

Ferrules are used to seal the connection of the column or liner to the GC system.

**Considerations in ferrule selection include:**

- Leak free seal
- Accommodate various column ODs
- Seal with minimum torque
- Non-stick to column or fittings
- Withstand temperature cycling

**Minimizing problems associated with ferrules:**

- Do not over tighten
- Ensure clean prior to use
- Bake out prior to use
- Change ferrule when installing new column
- Use correct ferrule for column size

## Ferrule selection guide

| Material | Uses | Advantages | Disadvantages |
|---|---|---|---|
| 100% Graphite | FID, NPD | • Easy-to-use stable seal<br>• High temperature limit<br>• Easily removed<br>• Reusable | • Not for MS or oxygen-sensitive detectors<br>• Soft, easily deformed or destroyed<br>• Possible system contamination |
| 15% Graphite/85% Vespel | MS and oxygen-sensitive detectors | • Long lifetime<br>• High temperature limit<br>• MS compatible | • Cannot be re-used<br>• Must be re-tightened after initial temperature cycle |
| SilTite metal | MS and oxygen-sensitive detectors | • Long lifetime<br>• High temperature limit<br>• MS compatible | • Cannot be re-used |

## SilTite metal ferrules

SilTite

**Designed for connecting fused silica GC columns and tubing to mass spectrometer interfaces and injectors.**

SilTite metal ferrules provide a continuous leak free connection without the need to re-tighten the nut after a few temperature cycles. SilTite ferrules are a high performing alternative to Graphite/Vespel ferrules in a GCMS system. Their performance and cost effectiveness also makes them ideal for connecting GC columns to injectors and atmospheric detectors.

## SilTite GC connectors

SilTite

Column connections in GC have traditionally suffered from unreliability, leaks, excessive dead volumes and lack of inertness, leading to poor chromatography results and instrument downtime.

SilTite GC connectors are designed to minimize installation time and provide ongoing, robust connections throughout the life of the GC column.

## SilTite FingerTite ferrules

**Designed for each injector and detector, simplify your GC column installation.**

- Typical kit contains 5 x female nuts, 10 x ferrules and 1 x measuring tool.
- A ferrule system for GC systems delivering an easy, leak free installation for capillary columns without the use of any tools.
- SilTite FingerTite will simplify your column installation process, giving you less hassle and more time for chromatography.

## SilTite µ-Union

**Designed to connect columns without the complications of conventional connectors.**

- Tubing connections without leakage concern from temperature cycling or fear of getting pieces of ferrule stuck inside the tubing.
- Low thermal mass: 9 mm in length and mass <0.5 g.
- Available in kits to connect a range of columns from 0.1 mm ID through to 0.53 mm ID.
- Each kit contains: 5 x ferrules, 2 x male µ-connector end fittings, 2 x female µ-connector end fittings and installation tooling.

*The SilTite µ-Union comes fitted standard when you order a GC capillary column with integrated guard (5 m). Just add SGXX to the end of the column part number where XX is the column ID e.g. 054101SG32 for a 0.32 mm ID guard on column part number 054101.*

| Part number | Part description and detail |
|---|---|
| 073560 | SilTite µ-Union for joining 0.10-0.25 mm and 0.10-0.25 mm ID columns/fused silica |
| 073561 | SilTite µ-Union for joining 0.10-0.25 mm and 0.32 mm ID columns/fused silica |
| 073562 | SilTite µ-Union for joining 0.10-0.25 mm and 0.53 mm ID columns/fused silica |
| 073563 | SilTite µ-Union for joining 0.32 mm and 0.32 mm ID columns/fused silica |
| 073564 | SilTite µ-Union for joining 0.32 mm and 0.53 mm ID columns/fused silica |
| 073565 | SilTite µ-Union for joining 0.53 mm and 0.53 mm ID columns/fused silica |
| Replacement parts | |
| 073566 | Replacement SilTite µ-Union ferrules for joining 0.10-0.25 mm and 0.10-0.25 mm ID columns/fused silica, PK10 |
| 073567 | Replacement SilTite µ-Union ferrules for joining 0.10-0.25 mm and 0.32 mm ID columns/fused silica, PK10 |
| 073568 | Replacement SilTite µ-Union ferrules for joining 0.10-0.25 mm and 0.53 mm ID columns/fused silica, PK10 |
| 073569 | Replacement SilTite µ-Union ferrules for joining 0.32 mm and 0.32 mm ID columns/fused silica, PK10 |
| 073570 | Replacement SilTite µ-Union ferrules for joining 0.32 mm and 0.53 mm ID columns/fused silica, PK10 |
| 073571 | Replacement SilTite µ-Union ferrules for joining 0.53 mm and 0.53 mm ID columns/fused silica, PK10 |
| 073572 | Replacement SilTite µ-Union only (no ferrules) for joining 0.10-0.32 mm and 0.10-0.32 mm ID columns/fused silica, PK5 |
| 073573 | Replacement SilTite µ-Union only (no ferrules) for joining 0.10-0.32 mm and 0.53 mm ID columns/fused silica, PK5 |
| 073574 | Replacement SilTite µ-Union only (no ferrules) for joining 0.53 mm and 0.53 mm ID columns/fused silica, PK5 |

## SilTite FingerTite ferrules

| Description | Column ID | Ferrule ID | Pack size | Part number |
|---|---|---|---|---|
| **For Agilent 7890, 6890, 6850, 5890 and 4890** | | | | |
| SilTite FingerTite INJ/FID starter kit | 0.10-0.25 mm | 0.4 mm | * | 073610 |
| SilTite FingerTite capillary/FID starter kit | 0.10-0.25 mm | 0.4 mm | * | 073611 |
| SilTite FingerTite INJ/MS starter kit | 0.10-0.25 mm | 0.4 mm | * | 073612 |
| SilTite FingerTite INJ/FID starter kit | 0.53 mm | 0.7 mm | * | 07361053 |
| SilTite FingerTite injector starter kit | 0.53 mm | 0.7 mm | * | 07361054 |
| **Replacement parts** | | | | |
| SilTite FingerTite ferrule 0.4 mm | 0.10-0.25 mm | 0.4 mm | 10 | 073630 |
| SilTite FingerTite ferrule 0.5 mm | 0.32 mm | 0.5 mm | 10 | 073631 |
| SilTite FingerTite ferrule 0.7 mm | 0.53 mm | 0.7 mm | 10 | 073632 |
| SilTite FingerTite blanking ferrule | – | – | 2 | 073633 |
| SilTite FingerTite female nut | – | – | 5 | 073636 |
| SilTite FingerTite INJ base seal | 0.10-0.25 mm | – | 2 | 073640 |
| SilTite FingerTite capillary adaptor | – | – | 1 | 0736101 |
| SilTite FingerTite MS adaptor | – | – | 1 | 0736102 |
| SilTite FingerTite FID detector | – | – | 1 | 0736103 |
| SilTite FingerTite injector adaptor (includes 2 base seals) | 0.10-0.25 mm | – | 1 | 0736104 |

**Each starter kit includes all the parts necessary to convert one GC system (one injector and one detector) to the SilTite FingerTite system. In addition there are five SilTite FingerTite nuts, ten SilTite FingerTite ferrules, and a ferrule install tool which allows you to seat the ferrule in the correct position on the capillary column.*

## Ferrules

| Instrument | Column ID | Ferrule ID | Pack size | Part number |
|---|---|---|---|---|
| **15% Graphite/85% Vespel ferrules** | | | | |
| Injectors and detectors at atmospheric pressure e.g. FID | 0.10-0.25 mm | 0.4 mm | 10 | 073109 |
| | 0.32 mm | 0.5 mm | 10 | 073111 |
| | 0.53 mm | 0.8 mm | 10 | 073113 |
| | for 1/8" OD packed columns | 1/8" | 10 | 072669 |
| | for 1/4" OD packed columns | 1/4" | 10 | 072667 |
| GCMS interface connection | 0.10-0.25 mm | 0.4 mm | 10 | 072663 |
| | 0.32 mm | 0.5 mm | 10 | 072654 |
| | 0.53 mm | 0.8 mm | 10 | 072655 |
| **100% Graphite ferrules** | | | | |
| Injectors and detectors at atmospheric pressure e.g. FID (not for GCMS) | 0.10-0.32 mm | 0.5 mm | 10 | 072635 |
| | 0.45-0.53 mm | 0.8 mm | 10 | 072636 |
| | for 1/8" OD packed columns | 1/8" | 10 | 072602 |
| | for 1/4" OD packed columns | 1/4" | 10 | 072601 |
| **SilTite metal ferrules** | | | | |
| GCMS interface connection (starter kit) | 0.10-0.25 mm | 0.4 mm | 10* | 073200 |
| | 0.32 mm | 0.5 mm | 10* | 073201 |
| | 0.53 mm | 0.8 mm | 10* | 073202 |
| Split/splitless injectors (starter kit) | 0.10-0.25 mm | 0.4 mm | 10# | 073270 |
| | 0.32 mm | 0.5 mm | 10# | 073271 |
| | 0.45-0.53 mm | 0.8 mm | 10# | 073272 |
| | 1/32" | 0.81 mm | 10# | 073273 |

**Includes ten ferrules, two SilTite nuts. #Includes ten ferrules, two SilTite nuts and two SilTite inlet base seals.*

## Ferrules continued

| Instrument | Column ID | Ferrule ID | Pack size | Part number |
|---|---|---|---|---|
| **Replacement SilTite metal ferrules** | | | | |
| All connections | 0.10-0.25 mm | 0.4 mm | 10 | 073220 |
| | 0.32 mm | 0.5 mm | 10 | 073221 |
| | 0.53 mm | 0.8 mm | 10 | 073222 |
| | 1/32" | 0.81 mm | 10 | 073219 |
| **Replacement SilTite nuts** | | | | |
| GCMS interface connection | – | – | 5 | 073224 |
| Split/splitless injector | – | – | 5 | 073226 |
| **Replacement SilTite base seals** | | | | |
| Split/splitless injector | – | – | 2 | 073400 |
| | – | – | 10 | 073401 |

# Connectors and ferrules | PerkinElmer

## SilTite FingerTite ferrules

SilTite FingerTite

| Description | Column ID | Ferrule ID | Pack size | Part number |
|---|---|---|---|---|
| SilTite FingerTite PerkinElmer injector/GCMS starter kit | 0.10-0.25 mm | 0.4 mm | * | 073623 |
| SilTite FingerTite PerkinElmer injector/FID starter kit | 0.10-0.25 mm | 0.4 mm | * | 073622 |
| **Replacement parts** | | | | |
| SilTite FingerTite ferrule 0.4 mm | 0.10-0.25 mm | 0.4 mm | 10 | 073630 |
| SilTite FingerTite ferrule 0.5 mm | 0.32 mm | 0.5 mm | 10 | 073631 |
| SilTite FingerTite ferrule 0.7 mm | 0.53 mm | 0.7 mm | 10 | 073632 |
| SilTite FingerTite blanking ferrule | – | – | 2 | 073633 |
| SilTite FingerTite female nut | – | – | 5 | 073636 |

**Each starter kit includes all the parts necessary to convert one GC system (one injector and one detector) to the SilTite FingerTite system. In addition there are five SilTite FingerTite nuts, ten SilTite FingerTite ferrules, and a ferrule install tool which allows you to seat the ferrule in the correct position on the capillary column.*

## Ferrules

| Instrument | Column ID | Size of nut | Ferrule ID | Pack size | Part number |
|---|---|---|---|---|---|
| **15% Graphite/85% Vespel ferrules** | | | | | |
| For injectors and detectors at atmospheric pressure e.g. FID | 0.10-0.25 mm | 1/16" | 0.4 mm | 10 | 072663 |
| | 0.10-0.25 mm | 1/8" | 0.4 mm | 10 | 0726703 |
| | 0.32 mm | 1/16" | 0.5 mm | 10 | 072654 |
| | 0.32 mm | 1/8" | 0.5 mm | 10 | 0726702 |
| | 0.45-0.53 mm | 1/16" | 0.8 mm | 10 | 072655 |
| | 0.45-0.53 mm | 1/8" | 0.8 mm | 10 | 072671 |
| | for 1/8" OD packed columns | 1/8" | 1/8" | 10 | 072669 |
| | for 1/4" OD packed columns | 1/4" | 1/4" | 10 | 072667 |

## Ferrules continued

| Instrument | Column ID | Size of nut | Ferrule ID | Pack size | Part number |
|---|---|---|---|---|---|
| **100% Graphite ferrules** | | | | | |
| Injectors and detectors at atmospheric pressure e.g. FID (not for GCMS) | 0.10-0.32 mm | 1/16" | 0.5 mm | 10 | 072627 |
| | 0.10-0.32 mm | 1/8" | 0.5 mm | 10 | 072624 |
| | 0.45-0.53 mm | 1/16" | 0.8 mm | 10 | 072626 |
| | 0.45-0.53 mm | 1/8" | 0.8 mm | 10 | 0726280 |
| | 1/8" OD packed columns | 1/8" | 1/8" | 10 | 072622 |
| | 1/4" OD packed columns | 1/4" | 1/4" | 10 | 072621 |
| **SilTite metal ferrules** | | | | | |
| GCMS interface connection (starter kit) | 0.10-0.25 mm | – | 0.4 mm | 10* | 073200 |
| | 0.32 mm | – | 0.5 mm | 10* | 073201 |
| | 0.53 mm | – | 0.8 mm | 10* | 073202 |
| **Replacement SilTite metal ferrules** | | | | | |
| GCMS interface connection | 0.10-0.25 mm | – | 0.4 mm | 10 | 073220 |
| | 0.32 mm | – | 0.5 mm | 10 | 073221 |
| | 0.53 mm | – | 0.8 mm | 10 | 073222 |
| | 1/32" | – | 0.81 mm | 10 | 073219 |
| **Replacement SilTite nuts** | | | | | |
| SilTite metal nuts | – | – | – | 5 | 073224 |

**Includes ten ferrules, two SilTite nuts.*

# Connectors and ferrules | Shimadzu

## SilTite FingerTite ferrules

SilTite FingerTite

| Description | Column ID | Ferrule ID | Pack size | Part number |
|---|---|---|---|---|
| **For Shimadzu GC-2030 and GC-2010** | | | | |
| SilTite FingerTite INJ/FID starter kit | 0.10-0.25 mm | 0.4 mm | * | 073619 |
| SilTite FingerTite INJ/MS starter kit | 0.10-0.25 mm | 0.4 mm | * | 073618 |
| SilTite FingerTite INJ/FID starter kit | 0.53 mm | 0.7 mm | * | 07362053 |
| **Replacement parts** | | | | |
| SilTite FingerTite ferrule 0.4 mm | 0.10-0.25 mm | 0.4 mm | 10 | 073630 |
| SilTite FingerTite ferrule 0.5 mm | 0.32 mm | 0.5 mm | 10 | 073631 |
| SilTite FingerTite ferrule 0.7 mm | 0.53 mm | 0.7 mm | 10 | 073632 |
| SilTite FingerTite ferrule blanking | – | – | 2 | 073633 |
| SilTite FingerTite female nut | – | – | 5 | 073636 |

**Each starter kit includes all the parts necessary to convert one GC system (one injector and one detector) to the SilTite FingerTite system. In addition there are five SilTite FingerTite nuts, ten SilTite FingerTite ferrules, and a ferrule install tool which allows you to seat the ferrule in the correct position on the capillary column.*

# Ferrules

| Column ID | Description | Pack size | Part number |
|---|---|---|---|
| **For Shimadzu GC-2030, GC-2014, GC-2010, and GC-17A injectors (not for MS interfaces or QP2010 injector)** | | | |
| 0.10-0.32 mm ID columns | 100% Graphite | 10 | 0726080 |
| 0.45-0.53 mm ID columns | 100% Graphite | 10 | 0726082 |
| 5 mm OD packed columns | 100% Graphite | 10 | 0726001 |
| 0.10-0.25 mm ID columns | SilTite metal - initial installation | 10* | 073350 |
| 0.10-0.25 mm ID columns | SilTite ferrules | 10 | 073227 |
| 0.32 mm ID columns | SilTite metal - initial installation | 10* | 073351 |
| 0.32 mm ID columns | SilTite ferrules | 10 | 073228 |
| 0.45-0.53 mm ID columns | SilTite metal - initial installation | 10* | 073352 |
| 0.53 mm ID columns | SilTite ferrules | 10 | 073229 |
| n/a | SilTite metal nuts - slotted | 5 | 073232 |
| **For Shimadzu QP5000/5050 standard MS interface** | | | |
| QP5000-I 0.10-0.25 mm ID columns | 15% Graphite/85% Vespel ferrules | 10 | 0726563 |
| QP5000-I 0.32 mm ID columns | 15% Graphite/85% Vespel ferrules | 10 | 0726564 |
| QP5000-II and QP5050 0.10-0.25 mm ID columns | 15% Graphite/85% Vespel ferrules | 10 | 0726561 |
| QP5000-II and QP5050 0.32 mm ID columns | 15% Graphite/85% Vespel ferrules | 10 | 0726562 |
| 0.10-0.25 mm ID columns | SilTite metal - initial installation | 10* | 073204 |
| 0.10-0.25 mm ID columns | SilTite ferrules | 10 | 073227 |
| 0.32 mm ID columns | SilTite metal - initial installation | 10* | 073205 |
| 0.32 mm ID columns | SilTite ferrules | 10 | 073228 |
| 0.53 mm ID columns | SilTite ferrules | 10 | 073229 |
| n/a | SilTite metal nuts - QP5000/5050 standard MS interface | 5 | 073233 |
| **For Shimadzu QP5000/5050 wide bore MS interface, QP2010 injector and QP2010 standard MS interface** | | | |
| 0.10-0.25 mm ID columns | 15% Graphite/85% Vespel ferrules | 10 | 072663 |
| 0.32 mm ID columns | 15% Graphite/85% Vespel ferrules | 10 | 072654 |
| 0.45-0.53 mm ID columns | 15% Graphite/85% Vespel ferrules | 10 | 072655 |
| 0.10-0.25 mm ID columns | SilTite metal - initial installation | 10* | 073200 |
| 0.10-0.25 mm ID columns | SilTite ferrules | 10 | 073220 |
| 0.32 mm ID columns | SilTite metal - initial installation | 10* | 073201 |
| 0.32 mm ID columns | SilTite ferrules | 10 | 073221 |
| 0.45-0.53 mm ID columns | SilTite metal - initial installation | 10* | 073202 |
| 0.45-0.53 mm ID columns | SilTite ferrules | 10 | 073222 |
| n/a | SilTite metal nuts | 5 | 073224 |
| **Replacement SilTite nuts** | | | |
| GC-2030/GC-2010 GCMS system | | 5 | 073224 |
| GC-2030/GC-2010 GCMS system with QP5000 series MS | | 5 | 073224 |
| GC-2030/GC-2014/GC-2010 GC injectors and atmospheric detectors | | 5 | 073224 |
| QP5000 jet separator MS interface | | 5 | 073224 |
| QP5000 direct MS interface | | 5 | 073233 |
| All injectors jet separator (starter kit), except GC-2030/GC-2014/GC-2010 | | 5 | 073232 |

**Includes ten ferrules, two SilTite nuts.*

## SilTite FingerTite ferrules

| Description | Column ID | Ferrule ID | Pack size | Part number |
|---|---|---|---|---|
| **For Thermo Scientific TRACE 1300 series GC** | | | | |
| SilTite FingerTite INJ/MS starter kit (ISQ/ITQ MS only) | 0.10-0.25 mm | 0.4 mm | * | 073612 |
| SilTite FingerTite injector starter kit** | 0.10-0.25 mm | 0.4 mm | * | 0736100 + 0736104 |
| **Replacement parts** | | | | |
| SilTite FingerTite ferrule 0.4 mm | 0.10-0.25 mm | 0.4 mm | 10 | 073630 |
| SilTite FingerTite ferrule 0.5 mm | 0.32 mm | 0.5 mm | 10 | 073631 |
| SilTite FingerTite ferrule 0.7 mm | 0.53 mm | 0.7 mm | 10 | 073632 |
| SilTite FingerTite blanking ferrule | – | – | 2 | 073633 |
| SilTite FingerTite female nut | – | – | 5 | 073636 |
| SilTite FingerTite INJ base seal | 0.10-0.25 mm | – | 2 | 073640 |
| SilTite FingerTite MS adaptor | – | – | 1 | 0736102 |
| SilTite FingerTite injector adaptor (includes 2 base seals) | 0.10-0.25 mm | – | 1 | 0736104 |

**Each starter kit includes all the parts necessary to convert one GC system (one injector and one detector) to the SilTite FingerTite system. In addition there are five SilTite FingerTite nuts, ten SilTite FingerTite ferrules, and a ferrule install tool which allows you to seat the ferrule in the correct position on the capillary column. ** Starter kit 0736100 requires injector adaptor 0736104.*

## Ferrules

| Instrument | Column ID | Ferrule ID | Pack size | Part number |
|---|---|---|---|---|
| **15% Graphite/85% Vespel ferrules** | | | | |
| For Thermo Scientific TRACE 1300 series GC split/splitless injectors | 0.10-0.25 mm | 0.4 mm | 10 | 073109 |
| | 0.32 mm | 0.5 mm | 10 | 073111 |
| | 0.53 mm | 0.8 mm | 10 | 073113 |
| For Thermo Scientific TRACE 1300 series GC GCMS interface connection | 0.10-0.25 mm | 0.4 mm | 10 | 072663 |
| | 0.32 mm | 0.5 mm | 10 | 072654 |
| | 0.53 mm | 0.8 mm | 10 | 072655 |
| **100% Graphite ferrules** | | | | |
| For Thermo Scientific TRACE 1300 series GC split/splitless injectors | 0.10-0.32 mm | 0.5 mm | 10 | 072635 |
| | 0.45-0.53 mm | 0.8 mm | 10 | 072636 |
| **SilTite metal ferrules** | | | | |
| GCMS interface connection (starter kit) | 0.10-0.25 mm | 0.4 mm | 10* | 073200 |
| | 0.32 mm | 0.5 mm | 10* | 073201 |
| | 0.53 mm | 0.8 mm | 10* | 073202 |
| For Thermo Scientific TRACE 1300 series GC split/splitless injectors (starter kit) | 0.10-0.25 mm | 0.4 mm | 10# | 073270 |
| | 0.32 mm | 0.5 mm | 10# | 073271 |
| | 0.45-0.53 mm | 0.8 mm | 10# | 073272 |
| | 1/32" | 0.81 mm | 10# | 073273 |
| **Replacement SilTite metal ferrules** | | | | |
| All GCMS interface connections | 0.10-0.25 mm | 0.4 mm | 10 | 073220 |
| | 0.32 mm | 0.5 mm | 10 | 073221 |
| | 0.53 mm | 0.8 mm | 10 | 073222 |
| | 1/32" | 0.81 mm | 10 | 073219 |
| For Thermo Scientific TRACE 1300 series GC split/splitless injector connections | 0.10-0.25 mm | 0.4 mm | 10 | 073220 |
| | 0.32 mm | 0.5 mm | 10 | 073221 |
| | 0.53 mm | 0.8 mm | 10 | 073222 |
| | 1/32" | 0.81 mm | 10 | 073219 |
| **Replacement SilTite nuts** | | | | |
| SilTite metal nuts for all GCMS interface connections | – | – | 5 | 073224 |
| For Thermo Scientific TRACE 1300 series GC split/splitless injector | – | – | 5 | 073226 |
| **Replacement SilTite base seals** | | | | |
| For Thermo Scientific TRACE 1300 series GC split/splitless injector | – | – | 2 | 073400 |
| | – | – | 10 | 073401 |

**Includes ten ferrules, two SilTite nuts. #Includes ten ferrules, two SilTite nuts and two SilTite inlet base seals.*

## Easy to install | Leak free | Stable

Trajan understands today's chromatographers need to move from tubing based flow systems to planar microchannel systems to deliver flexible chromatography solutions. SilFlow is an innovation in design and fabrication resulting in a highly efficient and reliable microfluidic platform that improves your GC connectivity to enable maximum chromatography performance.

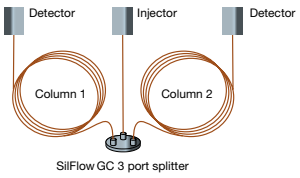
## Configuration options for your chromatography solutions

**The SilFlow microchannel device (MCD) is available in a number of configurations:**

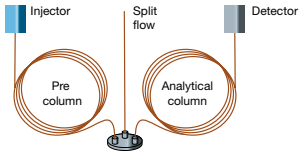
- 3 port GC splitters allowing flow splitting options with three different configurations.
- 4 port GC splitters offering similar configuration flexibility as the 3 port solution.
- Deans' switch MCD, perfect for multidimensional analyses.

**Some suggested application configurations for use with SilFlow splitters:**

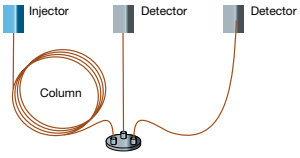
*One injection to two capillary columns*



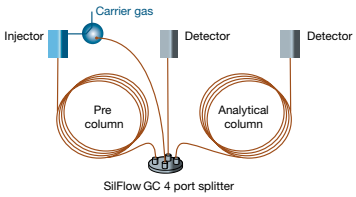

*Pre-column with split to analytical column*



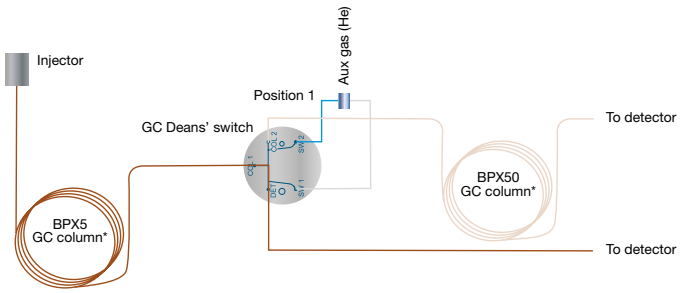

*One column to two detectors*




*Backflush*



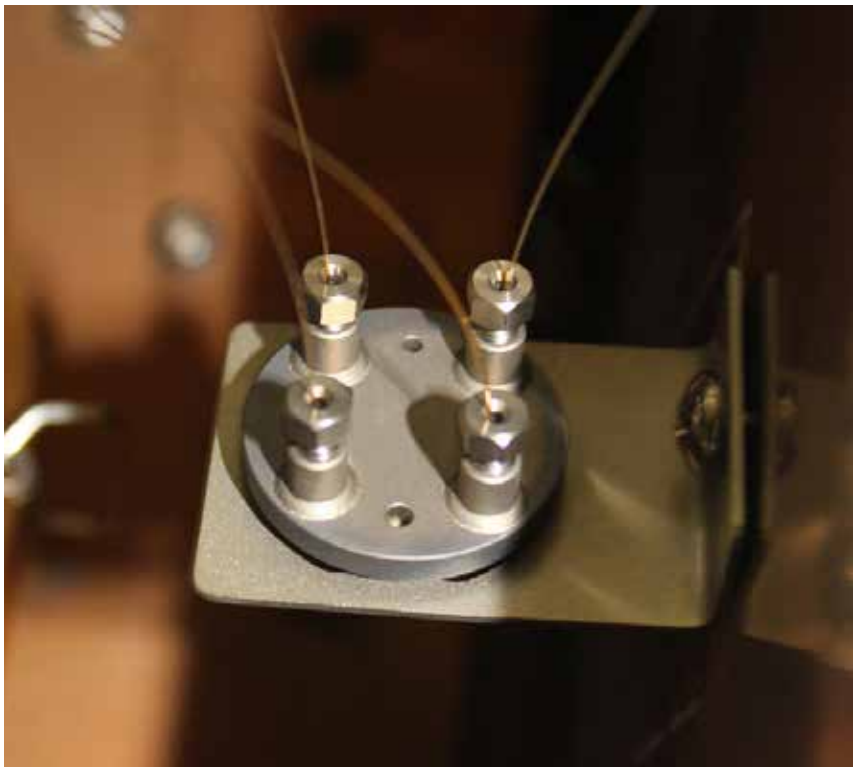

*SilFlow GC Deans' switch connected with BPX5 (Phenyl Polysilphenylene Siloxane) 1st dimension GC column and BPX50 2nd dimension GC column.*

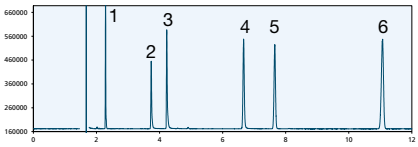



**1st and 2nd column dimension application specific. Contact your local Trajan representative.*

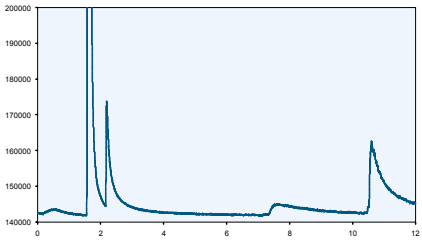
## Chemically inert

- Enabled by Trajan's expertise in surface chemistry, SilFlow features chemically deactivated stainless steel channels avoiding active sites experienced with conventional connections.
- SilFlow can be incorporated into your system without impacting your chromatography.

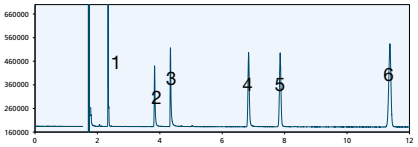





*a) Column only*



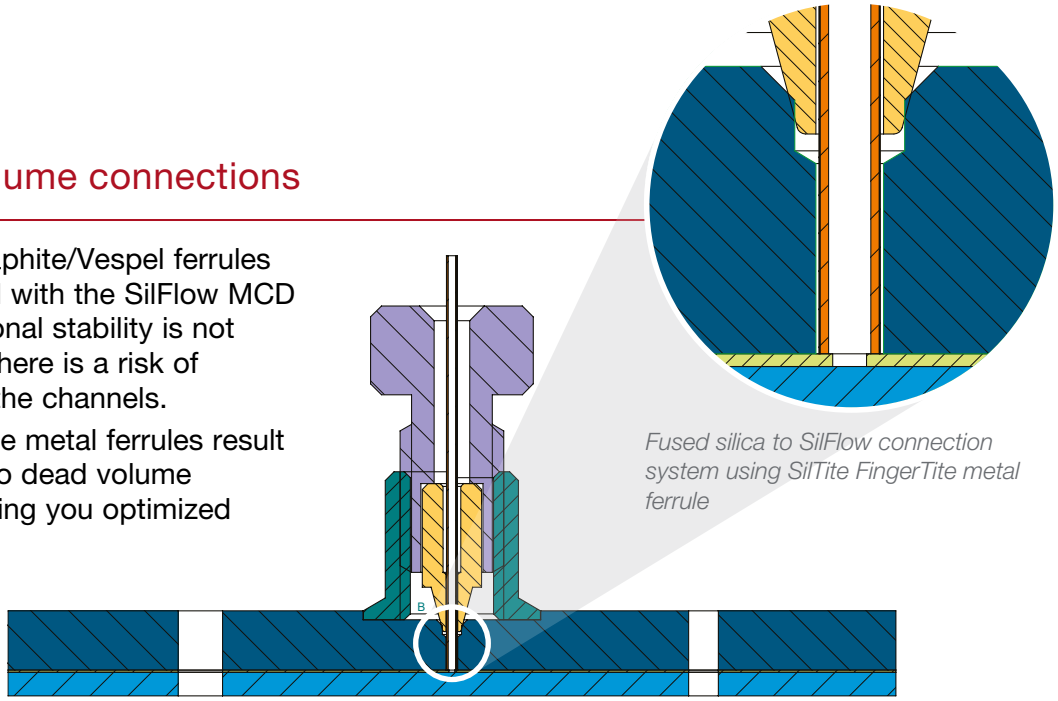
*b) Column with metal connector without special deactivation*




*c) Column with deactivated SilFlow (GC Deans' switch)*

## Low dead volume connections

- Graphite or Graphite/Vespel ferrules cannot be used with the SilFlow MCD as the dimensional stability is not adequate and there is a risk of contaminating the channels.
- SilTite FingerTite metal ferrules result in a reliable zero dead volume connection, giving you optimized peak shapes.



*Fused silica to SilFlow connection system using SilTite FingerTite metal ferrule*

## Superb operational stability

**SilFlow technical specifications:**

- Pressure capability - The SilFlow system can be operated at pressures greater than 25,000 psi (170,000 kPa).
- Thermal lag - SilFlow tracks oven temperature up to 20°C/min. The design of SilFlow alleviates cold spots and sample condensation.
- Maximum temperature - No practical temperature limit. Limited only by the temperature rating of the GC column being used, ≤420°C.

## Easy to install and leak free

SilFlow kits incorporate SilTite FingerTite fittings that are easy to set up and can be tightened using finger force to achieve a perfect, reliable seal, even for the most sensitive MS systems – no wrenches required!


Each SilFlow kit contains:

- SilFlow microfluidic device (MCD)
- SilTite FingerTite tool
- Mounting bracket
- Ferrules, nuts and blanking ferrules

## SilFlow GC 3 port splitter

| Part number | Part description and detail |
|---|---|
| 123722 | Port A 0.25/0.32 mm ID, ports B and C 0.25/0.32 mm ID SilFlow GC 3 port splitter kit |
| 123721 | Port A 0.53 mm ID, ports B and C 0.25/0.32 mm ID SilFlow GC 3 port splitter kit |
| 123720 | Port A 1.1 mm OD, ports B and C 0.25/0.32 mm ID SilFlow GC 3 port splitter kit |
| 123725 | Microchannel device only, port A 0.25/0.32 mm ID, ports B and C 0.25/0.32 mm ID SilFlow GC 3 port splitter |
| 123724 | Microchannel device only, port A 0.53 mm ID, ports B and C 0.25/0.32 mm ID SilFlow GC 3 port splitter |
| 123723 | Microchannel device only, port A 1.1 mm OD, ports B and C 0.25/0.32 mm ID SilFlow GC 3 port splitter |

## SilFlow GC 4 port splitter

| Part number | Part description and detail |
|---|---|
| 123732 | Port A 0.25/0.32 mm ID, ports B, C, and D 0.25/0.32 mm ID SilFlow GC 4 port splitter kit |
| 123731 | Port A 0.53 mm ID, ports B, C, and D 0.25/0.32 mm ID SilFlow GC 4 port splitter kit |
| 123730 | Port A 1.1 mm OD, ports B, C, and D 0.25/0.32 mm ID SilFlow GC 4 port splitter kit |
| 123735 | Microchannel device only, port A 0.25/0.32 mm ID, ports B, C, and D 0.25/0.32 mm ID SilFlow GC 4 port splitter |
| 123734 | Microchannel device only, port A 0.53 mm ID, ports B, C, and D 0.25/0.32 mm ID SilFlow GC 4 port splitter |
| 123733 | Microchannel device only, port A 1.1 mm OD, ports B, C, and D 0.25/0.32 mm ID SilFlow GC 4 port splitter |

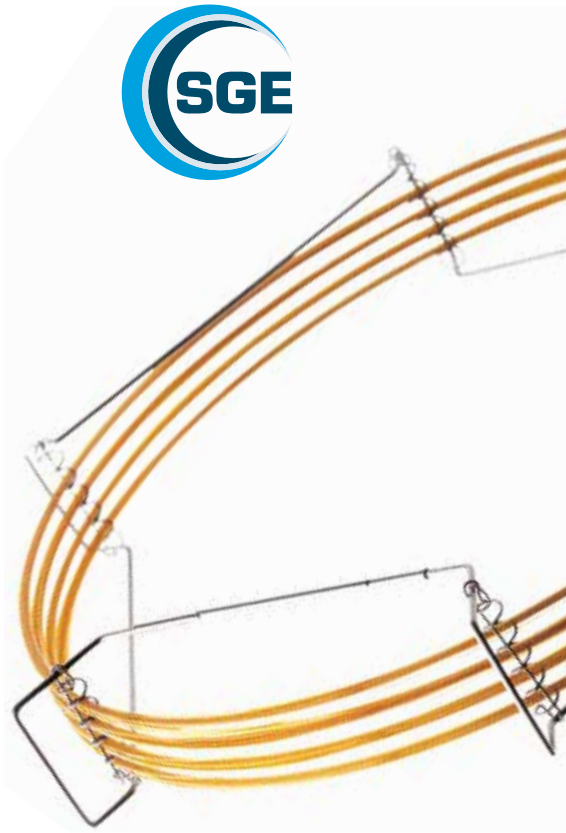
## SilFlow GC Deans' switch

| Part number | Part description and detail |
|---|---|
| 1237031 | Deans' switch kit (includes 1.1 mm OD tubing) |
| 1237261 | Microchannel device only Deans' switch |

## SilFlow replacement parts

| Part number | Part description and detail |
|---|---|
| **Replacement parts** | |
| 123704 | SilFlow nuts, PK10 |
| 123713 | SilFlow ferrules 0.35 mm ID, PK10 |
| 123706 | SilFlow ferrules 0.4 mm ID, PK10 |
| 123707 | SilFlow ferrules 0.5 mm ID, PK10 |
| 123709 | SilFlow ferrules 0.7 mm ID, PK10 |
| 123705 | SilFlow ferrules 1.1 mm ID, PK5 |
| 123715 | SilFlow blanking ferrules and pins, PK5 |
| 123717 | SilTite FingerTite tool |
| 123743 | SilFlow ferrules 0.55 mm ID, PK10 |
| 123744 | SilFlow ferrules 0.75 mm ID, PK10 |
| 123742 | SilFlow ferrules 0.8 mm ID, PK10 |
| 123755 | SilFlow stainless steel capillary tubing, 75 cm long, 1.1 mm OD sleeved to 1/16" at one end (not included in kits, must be purchased separately if required) |

## Minimal bleed | Highly inert
## Temperature stable



The GC column carries out the separation. When selecting a column for an application, four basic parameters need to be considered:

- Stationary phase
- Column internal diameter
- Film thickness
- Column length

A GC column is generally specified with two maximum operating temperatures:

- The isothermal limit at which the column may be run continuously.
- A programmed maximum where the column reaches a maximum for a limited period only.

There is also a minimum temperature below which a column will perform poorly. If a column is run continuously at the upper limit of temperature, column bleed will be observed. This is background noise caused by stationary phase degradation and this increases with increased film thickness.

## Adjusting GC column performance

| Column parameter | Parameters affecting resolution | | | Performance changes |
|---|---|---|---|---|
| | Efficiency | Retention | Selectivity | |
| Column length (m) | ✓ | | | Doubling column length increases resolution by ~40% |
| Internal diameter (mm) | ✓ | | | The smaller the column ID, the greater the efficiency and better the resolution |
| Film thickness (µm) | | ✓ | | The thicker the film, the greater the retention e.g. ideal for highly volatile compounds. The thinner the film, the sharper the peaks and lower the bleed |
| Stationary phase chemistry | | | ✓ | Altering the stationary phase can affect elution order and help separate closely, or co-eluting peaks |

# Stationary phase

### General rules on selecting a phase

- Select the least polar phase that will perform the separation you require.
- Non-polar stationary phases separate analytes predominantly by order of boiling point. Increase the amount of phenyl and/or cyanopropyl content in the phase, and the separation is then influenced more by differences in dipole moments or charge distributions (BP10 (1701), BPX35, BPX50, BPX70).
- To separate compounds that differ more in their hydrogen bonding capacities (for example aldehydes and alcohols), polyethylene glycol type phases are best suited (BP20 (WAX), BP21 (FFAP), SolGel-WAX).
- Wherever possible use published retention indices to assist in your selection. Retention indices are calculated for a range of probe compounds which can highlight specific selectivity characteristics of a stationary phase.

### Retention indices for eight cross-linked phases

The use of retention indices is a valuable tool in assisting selection of the stationary phase which provides maximum resolution for the compounds to be analyzed.

The retention indices of the five test compounds indicate the differences and similarities of each stationary phase. The values are calculated in reference to a homologous series of n-alkane hydrocarbons plotted on a logarithmic scale. Each n-alkane has a retention index of 100 times the carbon number (ie. C6, RI=600). Therefore, the retention index for each of the test compounds illustrates the elution position in reference to this n-alkane series.

Each probe compound is selected to represent the interaction characteristics of various organic functionalities.

Retention indices are calculated using the following formula:

| Probe compound | Interactions represented |
|---|---|
| Benzene | Aromatics, unsaturated hydrocarbons |
| Butanol | Alcohols, diols |
| 2-Pentanone | Ethers, esters, ketones and aldehydes |
| Nitropropane | Nitro and nitrile derivatives |
| Pyridine | Aromatic bases |

$$IA = 100N+100n\ (\log t'R(A) - \log t'R(N)\ ) / (\log t'R(N+n) - \log t'R(N)\ )$$

*IA is the retention index of compound A (from corrected retention times) which elutes between two n-paraffins separated by either one or two carbon numbers.*

| Phase | Benzene (X) | Butanol (Y) | 2-Pentanone (Z) | Nitropropane (U) | Pyridine (S) | Average |
|---|---|---|---|---|---|---|
| BP1 | 647 | 646 | 666 | 707 | 722 | 678 |
| BP5 | 667 | 665 | 692 | 743 | 746 | 703 |
| BPX5 | 664 | 667 | 697 | 752 | 750 | 706 |
| HT8 | 680 | 673 | 728 | 796 | 780 | 731 |
| BPX35 | 728 | 726 | 763 | 862 | 848 | 785 |
| BP10 (1701) | 709 | 774 | 772 | 862 | 832 | 790 |
| BP20 (WAX) | 947 | 1153 | 998 | 1217 | 1185 | 1100 |
| BPX70 | 1067 | 1219 | 1170 | 1365 | 1300 | 1224 |

*The table lists the responses to each test compound and the average value for eight cross-linked phases ranging from the non-polar BP1 to the very polar BPX70. The range has been developed to cover the widest possible range of compound functionality and application areas.*

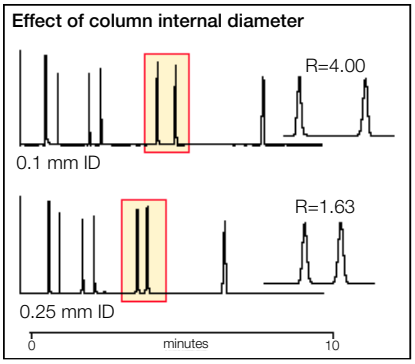
*Average retention index values are listed, and provide an indication of the phase polarity. This can assist in selecting a suitable stationary phase for a particular application area. The individual responses to each test compound can further assist in determining the best phase for any specific type or group of compounds.*

# Column internal diameter

### Effect of column internal diameter

The smaller the internal diameter the greater the efficiency and therefore the better the resolution. Reduce the diameter by half and the column efficiency doubles.

As the diameter increases, the film thickness can increase to maintain the same phase ratio. The thicker the film, the greater the loading capacity. Overloading a column will always result in loss of resolution. If the column diameter is halved while maintaining the same film thickness, then the loading capacity will also be halved.

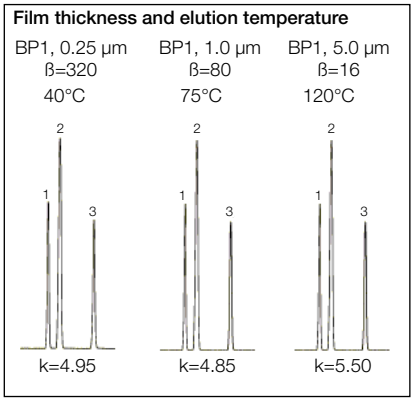



| Column ID | Recommendations |
|---|---|
| 0.1 mm and 0.15 mm | Fast GC columns ideal for FID, ECD. |
| 0.22 mm and 0.25 mm | Ideal for MS and high resolution applications. |
| 0.32 mm | Provide good resolution for most applications, ample sample loading and compatibility with nearly all detector systems. |
| 0.53 mm | Provide large sample capacities. |

# Film thickness

### Sample loading

For samples with a variation in solute concentration, a thick film column is recommended. This will reduce the possibility of broad overloaded peaks co-eluting with other compounds of interest. If the separation of two solutes is sufficient and co-elution is still unlikely, even with large differences in concentration, then a thinner film can be used.




### Volatility of solute

The greater the film thickness, the greater the retention of a solute, therefore the higher the elution temperature. As a rule, doubling the film thickness results in an increase in elution temperature of approximately 15-20°C, under isothermal conditions. Using a temperature program, the increase in elution temperature is slightly less.

As well as film thickness, changing the column internal diameter also effects the elution temperature. To avoid using two parameters that can alter individually, phase ratio is often used as it takes both into account.

The chromatograms demonstrate the effect on elution temperature for a mixture of compounds using 0.32 mm ID columns with film thickness of 0.25 µm, 1 µm and 5 µm.

An increase in film thickness from 0.25 µm to 5 µm needs a change in analysis temperature of 80°C to maintain the same elution time.

# Film thickness continued

### Phase ratio

Phase ratio encompasses both the film thickness and column internal diameter to give a value that can characterize all column internal diameters and film thickness combinations.

Calculate phase ratio using the following formula:

$$ß = d/4d_f$$

*where:*
*ß = phase ratio*
*d = column internal diameter (µm)*
*$d_f$ = film thickness (µm)*

From the phase ratio value, a column can be categorized for the type of application it would best suit. The smaller the ß value, the greater the concentration of phase to the volume of the column, making it better suited for analyzing volatile compounds. Columns which have thin films, are generally better suited for high molecular weight compounds and are characterized by large ß values.

| Film thickness (µm) | Column ID (µm) | | | | | |
|---|---|---|---|---|---|---|
| | 100 | 150 | 220 | 250 | 320 | 530 |
| | Phase ratio | | | | | |
| 0.1 | 250 | - | 550 | 625 | 800 | 1325 |
| 0.15 | - | - | - | - | - | 883 |
| 0.25 | - | 150 | 220 | 250 | 320 | 530 |
| 0.5 | - | 75 | 110 | 125 | 160 | 265 |
| 1.0 | - | - | 55 | 63 | 80 | 132 |
| 3.0 | - | - | - | - | 27 | 44 |
| 5.0 | - | - | - | - | 16 | 26 |

Keeping a similar phase ratio when changing column internal diameters will ensure that your chromatographic parameters will not need substantial changes.

# Column length

### Effect of column length

Always try to select the shortest column length that will provide the required resolution for the application (12-30 m).

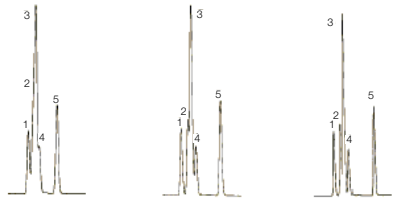
If the maximum column length available is being used and resolution of the sample mixture is still inadequate, try changing the stationary phase or internal diameter.

Resolution is proportional to the square root of the column efficiency. Therefore, doubling the column length will only increase the resolving power of the column by approximately 40%.

The three chromatograms give an indication of how column length influences the resolution of a mixture.

**Effect of column length**
Phase: BP20, 0.5 µm
Temperature: 170°C, isothermal
Linear velocity: 25 cm/sec, He

**Components**
1. o-Ethylphenol
2. p-Cresol
3. 2,4-Xylenol
4. 2,5-Xylenol
5. 2-iso-Propylphenol



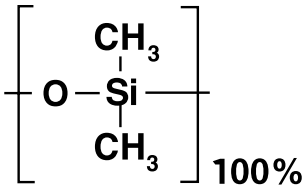
**12 m x 0.32 mm ID**
Efficiency (effective plates): 25,000

**25 m x 0.32 mm ID**
Efficiency (effective plates): 50,000

**50 m x 0.32 mm ID**
Efficiency (effective plates): 100,000

# BP1

**100% Dimethyl Polysiloxane**




- Classic dimethyl polysiloxane technology with high temperature cross-linking
- Excellent general purpose GC column
- Low bleed
- Non-polar
- Suitable for all routine analyses

**Application areas:** Suitable for analysis of hydrocarbons, aromatics, pesticides, phenol, herbicides, amines.

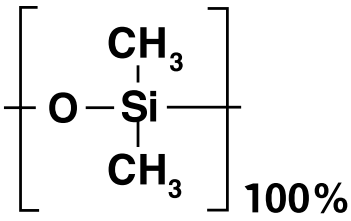
**Operating temperature:** 0.1-1 µm film thickness: -60°C to 340/360°C.
>1-3 µm film thickness: -60°C to 300/320°C.
>3-5 µm film thickness: -60°C to 280/300°C.

**Suitable replacement for:** CP-Sil 5 CB, DB-1, DB-Petro, Elite-1, HP-1, HP-1ms, Petrocol DH, Rtx-1, SPB-1, SPB-1 SULFUR, Ultra 1, VB-1, VF-1ms, ZB-1.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.1 | 10 | 0.1 | 054022 |
| 0.22 | 12 | 0.25 | 054046 |
| 0.22 | 25 | 0.25 | 054047 |
| 0.22 | 30 | 0.25 | 054050 |
| 0.22 | 50 | 0.25 | 054048 |
| 0.22 | 50 | 1 | 054054 |
| 0.22 | 60 | 0.25 | 054051 |
| 0.25 | 15 | 0.1 | 054039 |
| 0.25 | 15 | 0.25 | 054043 |
| 0.25 | 30 | 0.25 | 054044 |
| 0.25 | 30 | 1 | 054056 |
| 0.25 | 60 | 0.25 | 054045 |
| 0.32 | 12 | 0.5 | 054064 |
| 0.32 | 12 | 1 | 054070 |
| 0.32 | 25 | 0.5 | 054065 |
| 0.32 | 25 | 1 | 054071 |
| 0.32 | 30 | 0.25 | 054062 |
| 0.32 | 30 | 0.5 | 054068 |
| 0.32 | 30 | 3 | 054073 |
| 0.32 | 50 | 0.5 | 054066 |
| 0.32 | 50 | 1 | 054072 |
| 0.32 | 50 | 5 | 054082 |
| 0.32 | 60 | 0.5 | 054069 |
| 0.53 | 12 | 1 | 054086 |
| 0.53 | 25 | 1 | 054087 |
| 0.53 | 25 | 5 | 054095 |
| 0.53 | 30 | 1 | 054090 |
| 0.53 | 30 | 3 | 054808 |
| 0.53 | 30 | 5 | 054806 |
| 0.53 | 50 | 5 | 054096 |
| 0.53 | 60 | 5 | 054807 |
| 0.32 | 30 | 1 | 054813 |
| 0.25 | 30 | 0.5 | 054820 |
| 0.32 | 60 | 1 | 054810 |

## BPX1

**100% Dimethyl Polysiloxane**




- Non-polar column
- Dimensionally stabilized phase
- Low bleed
- Specifically designed for high temperature hydrocarbon analysis
- Ideal for simulated distillation

**Application areas:** ASTM methods D2887 and D6532.

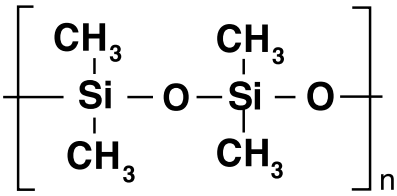
**Operating temperature:** Polyimide clad, 0.1-0.9 µm film thickness: -30°C to 400°C.
Polyimide clad, 2.65 µm film thickness: -30°C to 370°C.

**Suitable replacement for:** DB-2887, DB-HT, Elite-SimDist, HP-1, Petrocol 2887, Petrocol EX2887, Rtx-2887.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.1 | 10 | 0.1 | 054777 |
| 0.53 | 6 | 2.65 | 0548025 |
| 0.53 | 10 | 0.1 | 054803 |
| 0.53 | 10 | 0.9 | 054801 |
| 0.53 | 10 | 2.65 | 054802 |

## SolGel-1ms™

**100% Dimethyl Polysiloxane in a Sol-Gel matrix**




- A robust, inert, high temperature, non-polar phase for use with mass spectrometers
- Highly inert
- Less bleed - better MS library identification, less ion source maintenance, and better sensitivity
- Also suitable for use with all non-MS detectors

**Application areas:** Recommended for highly active compounds.

**Operating temperature:** 0.25 µm film thickness: 0°C to 340/360°C.

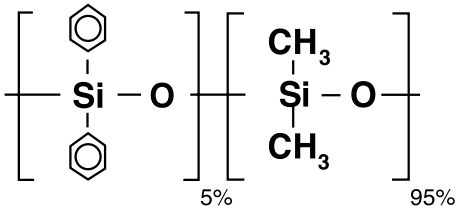
**Suitable replacement for:** CP-Sil 5 CB, DB-1, DB-Petro, Elite-1ms, HP-1ms, Petrocol DH, Rtx-1, SPB-1, SPB-1 SULFUR, TG-1MS, Ultra 1, VB-1, VF-1ms, ZB-1.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.25 | 30 | 0.25 | 054795 |
| 0.25 | 60 | 0.25 | 054793 |
| 0.32 | 30 | 0.25 | 054798 |

## BP5

**5% Phenyl / 95% Dimethyl Polysiloxane**

- Excellent general purpose GC column
- Low bleed
- Non-polar
- High temperature




**Application areas:** Aromatics, pesticides, herbicides, drugs of abuse, hydrocarbons.

**Operating temperature:** 0.25-1.5 µm film thickness: -60°C to 320/340°C.
>1.5 µm film thickness: -60°C to 280/300°C.

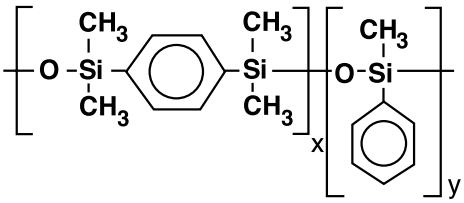
**Suitable replacement for:** CP-Sil 8 CB, DB-5, Elite-5, HP-5, MDN-5, PTE-5, Rtx-5, SPB-5, Ultra 2, VB-5, ZB-5.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.22 | 25 | 0.25 | 054168 |
| 0.25 | 15 | 0.25 | 054182 |
| 0.25 | 30 | 0.25 | 054183 |
| 0.25 | 30 | 1 | 054203 |
| 0.25 | 60 | 0.25 | 054184 |
| 0.32 | 25 | 0.5 | 054186 |
| 0.32 | 30 | 0.25 | 054177 |
| 0.32 | 30 | 0.5 | 054216 |
| 0.32 | 30 | 1 | 054189 |
| 0.53 | 30 | 1 | 054195 |
| 0.53 | 30 | 5 | 054196 |

## BP5MS

**5% Phenyl Polysilphenylene-siloxane**

- Perfect for your 5% GCMS analysis
- Optimized silphenylene content for general purpose MS analyses




**Application areas:** 5% GCMS analyses

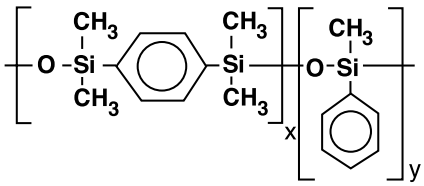
**Operating temperature:** 0.1-0.25 µm film thickness: -40°C to 330/350°C.

**Suitable replacement for:** CP-Sil 8 CB, DB-5ms, Elite-5ms, RTX-5ms, TG-5SilMS, VF-5ms, ZB-5ms.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.18 | 20 | 0.18 | 054301 |
| 0.25 | 15 | 0.25 | 054308 |
| 0.25 | 30 | 0.25 | 054310 |

# BPX5

**5% Phenyl Polysilphenylene-siloxane**




- High temperature
- General purpose GC column - suitable for over 80% of all routine analyses performed by gas chromatography
- Very low bleed - ideal for trace analysis
- Non-polar
- Extremely inert
- Ideal for GCMS

**Application areas:** Ultra trace analyses, pesticides/herbicides, hydrocarbons, solvents, phenols, amines, GCMS and other specific detector applications.

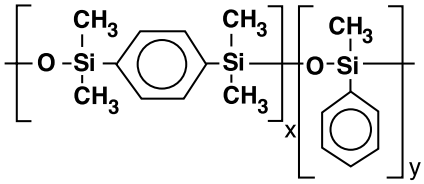
**Operating temperature:** 0.1-1.5 µm film thickness: -40°C to 360/370°C.
>1.5 µm film thickness: -40°C to 350/360°C.

**Suitable replacement for:** AT-5ms, CP-Sil 8 CB, DB-5, DB-5ms, DB-5.625, Elite-5ms, HP-5, HP-5ms, MDN-5S, Rtx-5MS, Rxi-5Sil MS, SPB-5, TG-5MS, TG-5SilMS, Ultra 2, VB-5, VF-5ms, XTI-5, ZB-5, ZB-5ms.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.1 | 10 | 0.1 | 054099 |
| 0.15 | 25 | 0.25 | 054104 |
| 0.22 | 12 | 0.25 | 054112 |
| 0.22 | 25 | 0.25 | 054113 |
| 0.22 | 50 | 0.25 | 054114 |
| 0.25 | 7 | 0.25 | 054149 |
| 0.25 | 15 | 0.25 | 054100 |
| 0.25 | 15 | 0.1 | 0542170 |
| 0.25 | 15 | 1 | 054121 |
| 0.25 | 30 | 0.25 | 054101 |
| 0.25 | 30 | 0.1 | 0541011 |
| 0.25 | 60 | 0.25 | 054102 |
| 0.25 | 30 | 0.5 | 0541025 |
| 0.25 | 30 | 1 | 054122 |
| 0.25 | 60 | 1 | 054123 |
| 0.32 | 12 | 0.25 | 054118 |
| 0.32 | 25 | 0.25 | 054119 |
| 0.32 | 15 | 0.25 | 054144 |
| 0.32 | 30 | 0.25 | 054145 |
| 0.32 | 60 | 0.25 | 054146 |
| 0.32 | 25 | 0.5 | 054125 |
| 0.32 | 30 | 0.5 | 0541205 |
| 0.32 | 6 | 1 | 0541261 |
| 0.32 | 12 | 1 | 054127 |
| 0.32 | 30 | 1 | 054153 |
| 0.32 | 50 | 1 | 054129 |
| 0.32 | 60 | 1 | 054154 |
| 0.53 | 12 | 1 | 054130 |
| 0.53 | 25 | 1 | 054131 |
| 0.53 | 25 | 0.25 | 054134 |
| 0.53 | 30 | 0.5 | 0541345 |
| 0.53 | 30 | 1.5 | 0541348 |
| 0.53 | 30 | 1 | 054148 |
| 0.53 | 30 | 3 | 054160 |

## BPX35

**35% Phenyl Polysilphenylene-siloxane**



- Mid polarity column
- Ideal for conformational analysis
- Inert
- Equivalent to USP phase G42
- High temperature
- Low bleed

**Application areas:** Environmental analyses, pesticides/herbicides, drugs of abuse, pharmaceuticals, polynuclear aromatic hydrocarbons, GCMS applications.

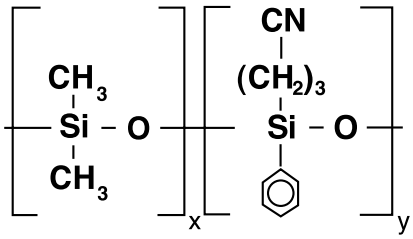
**Operating temperature:** 0.1-0.5 µm film thickness: 10°C to 330/360°C.

**Suitable replacement for:** DB-35, DB-35ms, Elite-35ms, HP-35, MDN-35, Rtx-35, SPB-35, TG-35MS, VF-35ms, ZB-35.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.1 | 10 | 0.1 | 054699 |
| 0.25 | 30 | 0.25 | 054701 |
| 0.25 | 60 | 0.25 | 054702 |
| 0.32 | 30 | 0.5 | 0547158 |

## BP624

**Cyanopropylphenyl Polysiloxane**



- US EPA method 624 optimized column
- Designed for volatiles analysis
- Ideal for EPA methods 624, 8240 and 8260 and method SW-846

**Application areas:** EPA method 624, drinking water volatiles, chlorinated hydrocarbons solvents.

**Operating temperature:** 1.4-3 µm film thickness: 0°C to 230/240°C.

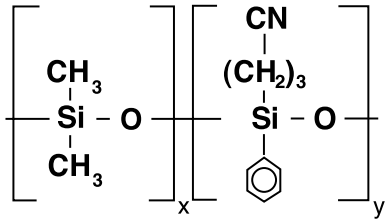
**Suitable replacement for:** AT-624, CP-Select 624 CB, DB-624, Elite-624, HP-VOC, OV-624, 007-624, Rtx-624, TG-624, VOCOL, ZB-624.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.25 | 15 | 1.4 | 054839 |
| 0.25 | 30 | 1.4 | 054840 |
| 0.25 | 60 | 1.4 | 054842 |
| 0.32 | 30 | 1.8 | 054832 |
| 0.32 | 60 | 1.8 | 054841 |
| 0.53 | 30 | 3 | 054836 |
| 0.53 | 50 | 3 | 054835 |
| 0.53 | 60 | 3 | 054838 |

## BP10 (1701)

### 14% Cyanopropylphenyl Polysiloxane

- Ideal for organochlorine pesticides analysis
- Highly inert
- Low bleed




**Application areas:** Environmental analyses (EPA methods 608 and 8081), pesticides/herbicides, drugs of abuse, pharmaceuticals.

**Operating temperature:** 0.25-0.5 µm film thickness: -20°C to 280/300°C.
1 µm film thickness: -20°C to 260/280°C.

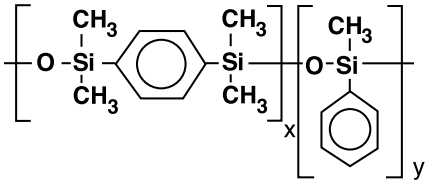
**Suitable replacement for:** CP-Sil 19 CB, 007-1701, DB-1701, Elite-1701, HP-1701, Rtx-1701, TG-1701, VF-1701ms, ZB-1701.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.22 | 25 | 0.25 | 054253 |
| 0.25 | 30 | 0.25 | 054256 |
| 0.32 | 25 | 0.5 | 054268 |
| 0.32 | 30 | 0.25 | 054259 |
| 0.32 | 30 | 1 | 054270 |
| 0.53 | 25 | 1 | 054280 |
| 0.53 | 30 | 1 | 054283 |

## BPX50

### 50% Phenyl Polysilphenylene-siloxane

- Mid polarity
- Inert
- Low bleed
- High temperature
- Ideal for a range of EPA methods and pharmaceutical applications




**Application areas:** EPA methods 604, 608, 8060, 8081, triazines/herbicides, drug screening, steroids and a variety of pharmaceutical applications.

**Operating temperature:** 0.1-1 µm film thickness: 80°C to 330/350°C.

**Suitable replacement for:** AT-50, CP-Sil 24 CB, DB-17, Elite-17, HP-17, OPTIMA 17MS, Rtx-50, Rxi-17, SPB-17, SPB-50, 007-17, VF-17ms, ZB-50.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.1 | 10 | 0.1 | 054740 |
| 0.15 | 30 | 0.15 | 054741 |
| 0.25 | 15 | 0.25 | 054750 |
| 0.25 | 30 | 0.25 | 054751 |
| 0.25 | 60 | 0.25 | 054752 |
| 0.32 | 30 | 0.25 | 054761 |
| 0.53 | 30 | 1 | 054772 |

# BP20 (WAX)

**Polyethylene Glycol**

- Industry standard wax column
- Polar phase
- Cross-linked for stability and washing

**Application areas:** Alcohol, free acids, fatty acid methyl esters, aromatics, solvents, essential oils.

**Operating temperature:** 0.1-1 µm film thickness: 20°C to 260/280°C.
>1 µm film thickness: 20°C to 240/260°C.

**Suitable replacement for:** Carbowax 20M, CP-Wax 52 CB, DB-WAX, Elite-WAX, HP-20M, HP-INNOWax RH-WAX, Rtx-Wax, Stabilwax, SUPELCOWAX 10, TG-WaxMS, VF-WAXms, ZB-WAX.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.22 | 25 | 0.25 | 054421 |
| 0.22 | 30 | 0.25 | 054424 |
| 0.22 | 50 | 0.25 | 054422 |
| 0.25 | 30 | 0.25 | 054427 |
| 0.25 | 60 | 0.25 | 054428 |
| 0.25 | 30 | 0.5 | 054415 |
| 0.25 | 30 | 1 | 054439 |
| 0.32 | 30 | 0.25 | 054433 |
| 0.32 | 50 | 0.25 | 054431 |
| 0.32 | 25 | 0.5 | 054436 |
| 0.32 | 30 | 0.5 | 054438 |
| 0.32 | 50 | 0.5 | 054437 |
| 0.32 | 25 | 1 | 054442 |
| 0.53 | 30 | 1 | 054444 |
| 0.53 | 30 | 1 | 054451 |
| 0.53 | 60 | 1 | 0544515 |
| 0.53 | 25 | 2 | 054456 |

## BP21 (FFAP)

**Polyethylene Glycol (PEG) – TPA Treated**

- Nitroterephthalic acid modified PEG
- Polar phase
- Ideal for low molecular weight acids

**Application areas:** Volatile free acids, fatty acid methyl esters, alcohols, aldehydes, acrylates, ketones.

**Operating temperature:** 0.25-1 µm film thickness: 35°C to 240/250°C.

**Suitable replacement for:** CP-Wax 58 FFAP CB, DB-FFAP, Elite-FFAP, HP-FFAP, Stabilwax-DA, TG-WaxMS A, ZB-FFAP.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.22 | 25 | 0.25 | 054462 |
| 0.25 | 30 | 0.25 | 054465 |
| 0.25 | 60 | 0.25 | 054466 |
| 0.32 | 25 | 0.25 | 054468 |
| 0.32 | 30 | 0.25 | 054471 |
| 0.32 | 50 | 0.25 | 054469 |
| 0.32 | 50 | 0.5 | 054480 |
| 0.53 | 30 | 0.5 | 054477 |
| 0.53 | 30 | 1 | 054478 |

## SolGel-WAX™

**Polyethylene Glycol (PEG) in a Sol-Gel matrix**

- Bonded polyethylene glycol
- Very robust high temperature column
- Less susceptible to damage by oxygen than conventional wax phases
- Polar phase
- Low bleed and inert

**Application areas:** Recommended for highly active compounds.

**Operating temperature:** 0.1-1 µm film thickness: 30°C to 260/280°C.

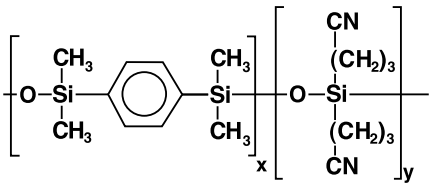
**Suitable replacement for:** AT-Wax, CP-Wax 52 CB, DB-Wax, Elite-WAX, HP-20M, HP-INNOWax, Nukol, Rtx-Wax, Stabilwax, SUPELCOWAX 10, TG-WaxMS, VB-WAX, ZB-WAX.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.1 | 10 | 0.1 | 0547100 |
| 0.25 | 30 | 0.25 | 054796 |
| 0.25 | 60 | 0.25 | 054791 |
| 0.25 | 30 | 1 | 054787 |
| 0.32 | 30 | 0.25 | 054788 |
| 0.32 | 60 | 0.25 | 054789 |
| 0.32 | 30 | 0.5 | 054797 |
| 0.32 | 60 | 0.5 | 054792 |
| 0.53 | 30 | 0.5 | 054786 |
| 0.53 | 30 | 1 | 054785 |

## BPX70

### 70% Cyanopropyl Polysilphenylene-siloxane

- High temperature
- Custom designed for separation of fatty acid methyl esters (FAMEs)
- Industry standard column for FAME analysis
- Ideal for cis/trans isomer separation
- Polar phase



**Application areas:** Fatty acid methyl esters, carbohydrates, pharmaceuticals, GCMS applications.

**Operating temperature:** 0.2-0.5 µm film thickness: 50°C to 250/260°C.

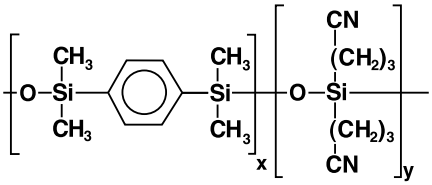
**Suitable replacement for:** CP-Sil 88, DB-23, Rtx-2330, SP-2330, SP-2380, VF-23ms, ZB-FAME.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.1 | 10 | 0.2 | 054600 |
| 0.22 | 25 | 0.25 | 054602 |
| 0.22 | 30 | 0.25 | 054612 |
| 0.22 | 50 | 0.25 | 054603 |
| 0.22 | 60 | 0.25 | 054613 |
| 0.25 | 30 | 0.25 | 054622 |
| 0.25 | 60 | 0.25 | 054623 |
| 0.25 | 120 | 0.25 | 054624 |
| 0.32 | 25 | 0.25 | 054606 |
| 0.32 | 30 | 0.25 | 054616 |
| 0.32 | 50 | 0.25 | 054607 |
| 0.32 | 60 | 0.25 | 054617 |
| 0.53 | 30 | 0.5 | 054620 |

## BPX90

### 90% Cyanopropyl Polysilphenylene-siloxane

- Unique bonded phase
- Highly polar
- Thermally stable



**Application areas:** Fast separation of fragrances, aromatics, petrochemical, pesticides, PCBs and isomers of Fatty Acid Methyl Esters (FAMEs).

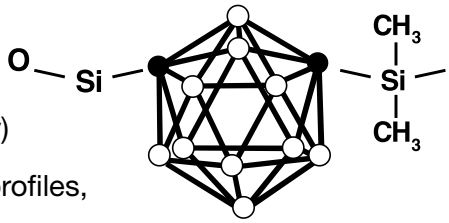
**Operating temperatures:** 0.25-0.5 µm film thickness: 80°C to 280°C.

**Suitable replacement for:** CP-Sil 88, DB-23, HP-23, Rtx-2330, SP-2330, SP-2380, TG-POLAR.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.25 | 15 | 0.25 | 054570 |
| 0.25 | 30 | 0.25 | 054580 |
| 0.25 | 60 | 0.25 | 054590 |
| 0.25 | 100 | 0.25 | 054596 |
| 0.32 | 30 | 0.5 | 054583 |

## HT5

### 5% Phenyl (equiv.) Polycarborane siloxane




- Ultra high temperature column range
- Unique phase – no equivalent phases
- Ideal for simulated distillation applications (petroleum industry)

**Application areas:** Simulated distillation, general hydrocarbon profiles, pesticides/herbicides, GCMS applications.

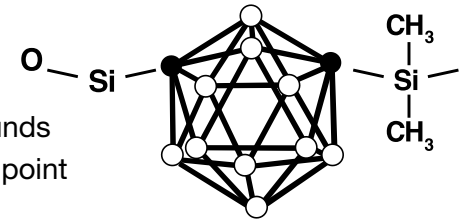
**Operating temperature:** 0.1-0.5 µm film thickness: 10°C to 380/400°C.

**Suitable replacement for:** No equivalents, unique ultra high temperature column.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.22 | 12 | 0.1 | 054631 |
| 0.22 | 25 | 0.1 | 054632 |
| 0.25 | 15 | 0.1 | 054633 |
| 0.25 | 30 | 0.1 | 054634 |
| 0.32 | 12 | 0.1 | 054641 |
| 0.32 | 25 | 0.1 | 054642 |
| 0.32 | 30 | 0.5 | 054668 |
| 0.53 | 6 | 0.1 | 054655 |
| 0.53 | 12 | 0.15 | 054657 |
| 0.53 | 25 | 0.15 | 054658 |

## HT8

### 8% Phenyl (equiv.) Polycarborane siloxane




- High temperature
- Low bleed
- Preferred column for polychlorinated biphenyl (PCB) compounds
- Separates PCBs on ortho ring substitution as well as boiling point
- Ideal for environmental analyses

**Application areas:** PCB congener analyses, nitro-substituted aromatics, polynuclear aromatic hydrocarbons, pesticides/herbicides.

**Operating temperature:** 0.1-0.25 µm film thickness: -20°C to 360/370°C.

**Suitable replacement for:** No equivalents, unique ultra high temperature column.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.22 | 25 | 0.25 | 054675 |
| 0.22 | 50 | 0.25 | 054676 |
| 0.25 | 30 | 0.25 | 054677 |
| 0.25 | 60 | 0.25 | 054683 |
| 0.32 | 25 | 0.25 | 054680 |

## HT8-PCB

### 8% Phenyl (equiv.) Polycarborane siloxane

- Unique ultra high temperature column optimizes for 209 PCB congener separations
- Optimized for 209 PCB congener separations

| Part number | Part description and detail |
|---|---|
| **HT8-PCB** | |
| 054236 | 0.25 mm ID x 60 m length HT8-PCB GC capillary column |
| **Fast HT8-PCB** | |
| 054690 | 0.1 mm ID x 10 m length Fast HT8-PCB GC capillary column |

# GC PLOT columns | SGE

The analysis of gases and volatiles has historically been challenging for gas chromatographers. The need to maintain resolution for very volatile compounds has meant that many methods are still based on traditional packed columns. This is limiting as packed columns offer low resolution and are often dedicated to one specific analysis.

## BP BOND Q

### Features and benefits

- Highly stable column can withstand repeated water injections
- Reduced need for particle trap due to minimal particle shredding
- Broad application range – ideal for volatile solvent and hydrocarbon analysis

### Recommended applications

- Volatile solvents
- Hydrocarbons

### Product specifications

- 100% Divinylbenzene

**Operating temperature:** 3-5 µm film thickness: -100°C to 300/320°C.

**Suitable replacement for:** PoraBOND Q, Rt-Q-BOND, Rt-QPLOT, SupelQ PLOT, TracePLOT TG-BOND Q.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.25 | 10 | 3 | 0570123 |
| 0.25 | 25 | 3 | 0570223 |
| 0.32 | 10 | 5 | 0570135 |
| 0.32 | 25 | 5 | 0570235 |
| 0.32 | 50 | 5 | 0570535 |

## BP BOND U

### Features and benefits

- Maximum temperature extended from 190°C to 300°C
- Bleed reduction provides lower detection limits and faster stabilization times
- Ideal for applications such as trace Hydrogen Sulfide ($H_2S$), Carbonyl Sulfide (COS) and mercaptans in hydrocarbon streams

### Recommended applications

- Trace $H_2S$, COS and mercaptans in hydrocarbon streams

### Product specifications

- Divinylbenzene Ethylene Glycol/Dimethylacrylate

**Operating temperature:** 7 µm film thickness: 300°C.

**Suitable replacement for:** PoraBOND U, Rt-U-BOND, TracePLOT TG-BOND U.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.32 | 10 | 7 | 0571137 |
| 0.32 | 25 | 7 | 0571237 |

## BP BOND Molsieve 5A

### Features and benefits

- Reduction in analysis times of up to 75% compared with packed columns
- Baseline separation of argon (Ar)/oxygen ($O_2$) achieved at ambient temperatures
- Fast elution of carbon monoxide (CO) with symmetrical peaks

### Recommended applications

- Separation of permanent gases
- Refinery or natural gases

### Product specifications

- Molecular Sieve (5A)

**Operating temperature:** 30 µm film thickness: -20°C to 350/350°C.

**Suitable replacement for:** CP-Molsieve 5A, Mol Sieve 5A PLOT, MXT-Msieve 5A, Rt-Msieve 5A, TracePLOT TG-BOND Msieve 5A.

| ID (mm) | Length (m) | Film thickness (µm) | Part number |
|---|---|---|---|
| 0.25 | 10 | 30 | 0572123 |
| 0.25 | 25 | 30 | 0572223 |
| 0.32 | 10 | 30 | 0572133 |
| 0.32 | 25 | 30 | 0572233 |
| 0.32 | 50 | 30 | 0572533 |

# Gas filters

## Clean gas | Accurate analysis
## Easily installed

Gas filters are an essential part of your GC analysis as contaminants in gases can significantly impact the quality of results. Oxygen, hydrocarbons and moisture can lead to problems such as noisy baselines, moisture entering the GC column, excessive bleed and septa degradation.

Even if carrier gas is of the highest quality, contaminants can be picked up from every part of the gas line. Therefore, a gas filter is needed to ensure that maximum productivity is achieved.


### Clean gas

Gas filters are designed to provide fast stabilization times to reduce gas consumption, and provide clean gas to GC and GCMS systems.

### Accurate analysis

Inserting a gas filter in the gas line significantly reduces impurity levels, thus improving trace analysis.

### Easily installed

The gas filter system consists of two key parts: the filters and the connecting unit. The connecting unit has inlet and outlet connectors for the gas lines. The connecting unit can be bench or wall-mounted and is available in 1, 2 and 4 port configurations and for 1/4" and 1/8" gas lines.

# Enhanced gas quality for maximum productivity

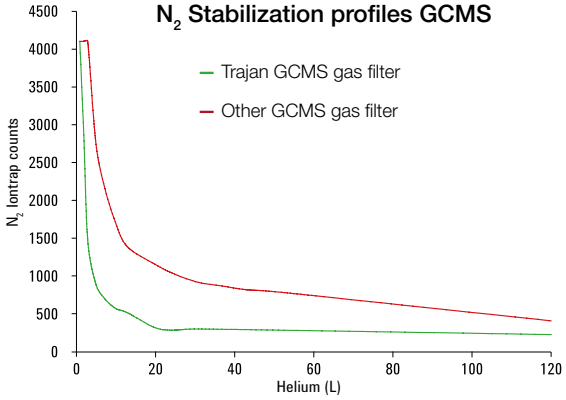



*Figure 1 shows the fast stabilization rate (the $N_2$ mass measured by mass spectrometry) of a GCMS after replacement of the filter.*

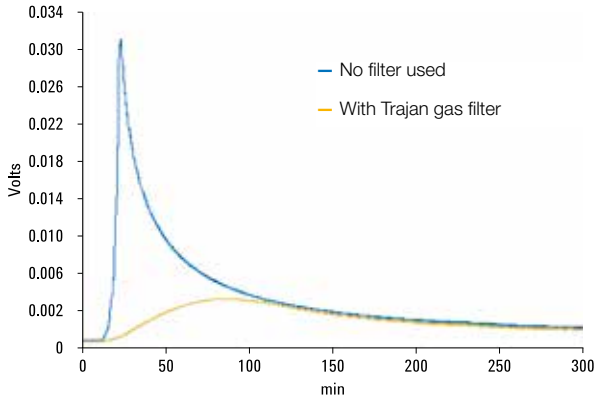



*Figure 2 shows the difference in bleed levels of two GC columns due to moisture exposure with and without a filter when running a temperature program (50°C to 350°C, 20°C/min). When no filter is used, an extreme rise in the bleed profile is clearly visible due to moisture in the carrier gas. By using gas filters, a normal bleed profile is achieved with the removal of all moisture in the carrier gas.*

## Gas filter selection guide

| Technique | Recommended filter(s) | Advantages |
|---|---|---|
| GCMS | Carrier gas | High data accuracy, lower maintenance |
| GC column | Moisture and oxygen | Longer lifetime |
| Electron capture detectors (GC) | Moisture and oxygen | High sensitivity |
| Thermal conductivity detectors (GC) | Moisture and oxygen | High sensitivity, lower maintenance |
| Flame ionization detectors (GC) | Two hydrocarbon | High sensitivity |
| Photoionization detectors (GC) | Oxygen and hydrocarbon | High sensitivity |

## Gas filter technical specifications

| | Oxygen filter | Moisture filter | Hydrocarbon filter | Carrier gas filter |
|---|---|---|---|---|
| Function | Removes oxygen as well as traces of sulfur and chlorine compounds from the carrier gas | Removes water, oil and other foreign material from the carrier gas | Removes organic compounds from gas streams | Single combination filter; removes water, oxygen and organic compounds |
| Indicator color change | From green to gray | From green to pale brown | No indicator | Oxygen: from green to gray<br>Moisture: from green to pale brown<br>Hydrocarbons: no indicator |
| Capacity | 150 mL oxygen | 7.2 g water | Approximately 7 g, depending on impurities | 100 mL oxygen, 1 g water, organics depending on impurities |
| Outlet concentration at operating flow of 1-10 L/min | <50 ppb | <0.1 ppm | <0.1 ppm | Oxygen <50 ppb<br>Moisture <0.1 ppm<br>Organics <0.1 ppm |

# Gas filters

## Gas filters

| Part number | Part description and detail |
|---|---|
| 1035230 | Gas filter - Hydrocarbon |
| 1035220 | Gas filter - Moisture |
| 1035210 | Gas filter - Oxygen |
| 1035250 | Gas filter - Carrier gas |

## Connecting units

| Part number | Part description and detail |
|---|---|
| 1035004 | Gas filter connecting unit 1/4" (high flow) |
| 1035008 | Gas filter connecting unit 1/8" (high flow) |
| 1035044 | Gas filter connecting unit 1/4" (4 position) |
| 1035048 | Gas filter connecting unit 1/8" (4 position) |
| 1035024 | Gas filter connecting unit 1/4" (2 position) |
| 1035028 | Gas filter connecting unit 1/8" (2 position) |
| 1035014 | Gas filter connecting unit 1/4" (1 position) |
| 1035018 | Gas filter connecting unit 1/8" (1 position) |

## Gas filter kits

| Part number | Part description and detail |
|---|---|
| 1035154 | Gas filter kit - Carrier gas 1/4" (1 gas filter, connecting unit - 1 position) |
| 1035158 | Gas filter kit - Carrier gas 1/8" (1 gas filter, connecting unit - 1 position) |
| 1035164 | Gas filter kit - FID 1/4" (4 gas filters, connecting unit - 4 position) |
| 1035168 | Gas filter kit - FID 1/8" (4 gas filters, connecting unit - 4 position) |

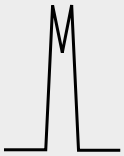
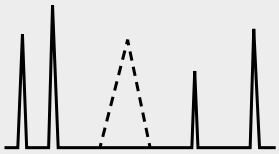
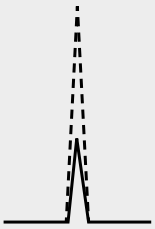
# Big Trap gas filter

For bulk purification applications or where several instruments are plumbed from a single source, a Big Trap gas filter is an ideal solution. A one-piece heavy walled aluminium tube provides 750 $cm^3$ of capacity and a pressure rating up to 250 psig.


## Big Traps

| Part number | Part description and detail |
|---|---|
| 1035334 | Big Trap gas filter 1/4" - Hydrocarbon |
| 1035338 | Big Trap gas filter 1/8" - Hydrocarbon |
| 1035324 | Big Trap gas filter 1/4" - Moisture |
| 1035328 | Big Trap gas filter 1/8" - Moisture |
| 1035314 | Big Trap gas filter 1/4" - Oxygen |
| 1035318 | Big Trap gas filter 1/8" - Oxygen |
| 1035344 | Big Trap gas filter 1/4" - Universal |
| 1035348 | Big Trap gas filter 1/8" - Universal |
| 1035300 | Big Trap mounting clip, PK2 |

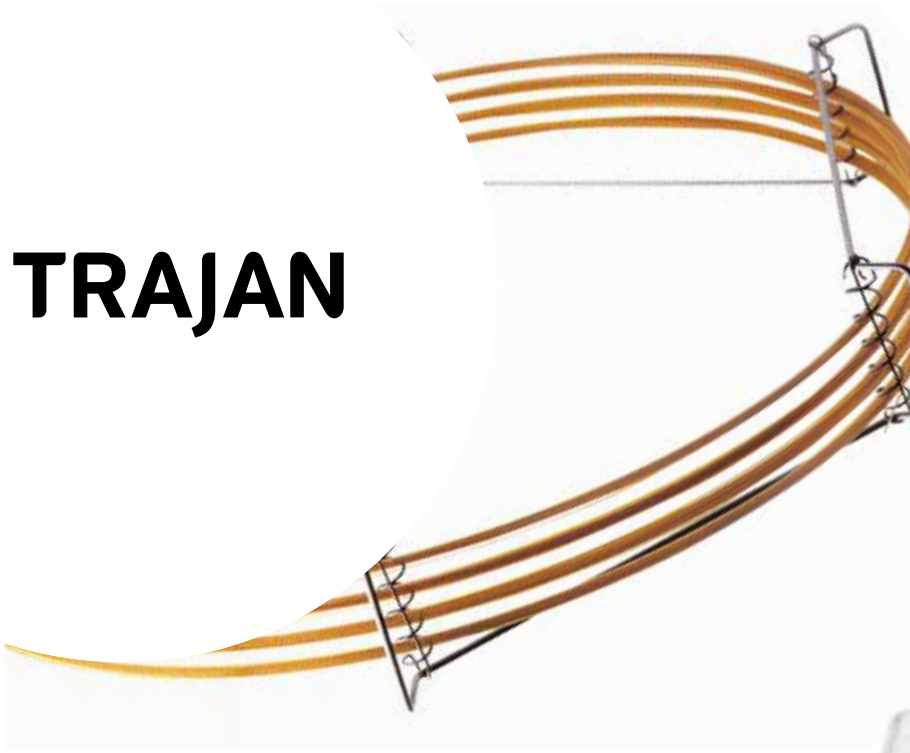
# Basic troubleshooting guide

| Problem | Reason | Resolution |
|---|---|---|
| Peak fronting  | Column overload | Reduce sample concentration or injection volume |
| | Incorrect polarity of column for compound | Use correct column |
| Peak tailing  | Column is active | Remove first meter of column, recheck; replace column if necessary |
| | Active inlet liner | Replace liner with clean, deactivated liner |
| | Incorrect column for analysis | Use correct column |
| | Incorrect column installation | Check inlet and outlet connections, and for any cold spots |
| Peak splitting  | Poor injection technique | Refine injection technique |
| | Mixed solvents | Use only single solvent system |
| | Poor resolution | Use different column or change temperature profile |
| Ghost peaks  | Run GC without injection; if ghost peaks disappear then the problem is probably the syringe or solvent; if ghost peaks are still evident then the problem is either the septum or the breakdown of the phase. | |
| | Contaminated syringe or solvents | Clean syringe thoroughly and replace solvents |
| | Septum bleed | Replace with Trajan septa |
| | Breakdown of column phase | Choose different phase which restricts breakdown |
| | Too large an injection volume | Decrease injection volume |
| Specific peaks low response  | Column is active | Remove first meter of column; recheck; replace column if necessary |
| | Active inlet liner | Replace liner with clean, deactivated liner |
| | Incorrect calculation of sample | Verify calculations |
| | FID altered gas flows | Readjust gas flows |





# TRAJAN






## GC consumables



1974 MICROCOLUMN 50 2024