Restek Sample Handling

Set Your Sights on Superior Performance

Restek PAL SPME Arrow

- Rugged stainless-steel construction ensures longer lifetimes.
- Faster extraction means higher sample throughput.
- Better sensitivity allows lower LODs.

RESTEK Pure Chromatography www.restek.com

Set Your Sights on Superior Performance

Solid phase microextraction (SPME) is a fast, automated sample preparation technology that reduces sample handling, extraction time, and solvent consumption, making it a popular choice in environmental, food, and clinical laboratories. However, traditional SPME fiber technology has some significant drawbacks, including poor mechanical stability and a small phase volume.

The Restek PAL SPME Arrow system (patent pending) is a revolutionary change in microextraction that combines exceptional robustness with faster extraction times and trace-level sensitivity (Table I). In contrast to traditional SPME fibers, SPME Arrows contain significantly more phase volume, which allows more target analyte to be extracted in less time. In addition, the stainless-steel construction, unique Arrow tip, inner stabilizing rod, and outer sheath design fully protect the phase, minimizing both mechanical damage and analyte loss during sample transfer.

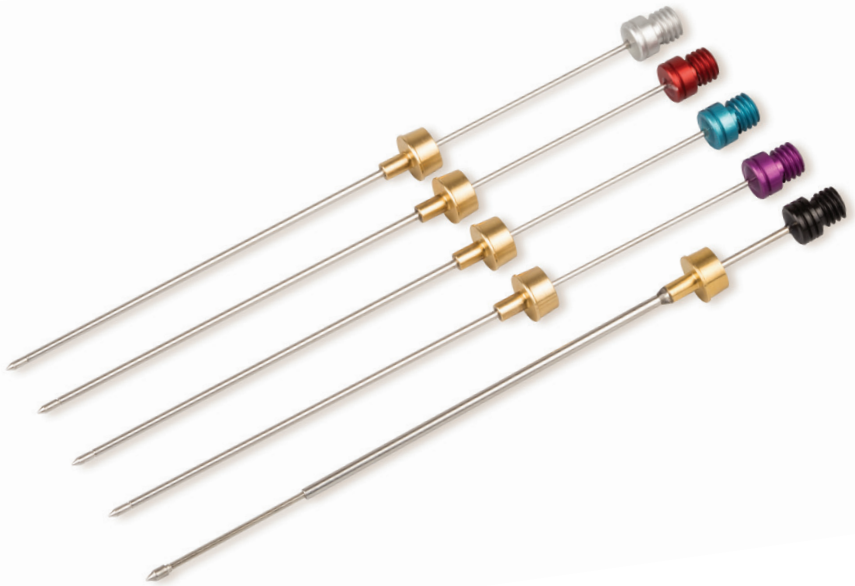


Table I: Comparing Restek PAL SPME Arrow to Traditional SPME Fiber (Headspace Technique)

	Traditional Fibers	1.1 mm Arrow	1.5 mm Arrow	The Arrow Advantage
Rugged stainless-steel construction • **Protective sheath** • **Stabilizing inner rod** • **Arrow-shaped tip**	No	Yes	Yes	• **Longer lifetimes:** Arrow construction protects the phase and minimizes both damage and analyte loss. • **Less downtime** due to breakage. • **Eliminate septa coring.**
Surface area	9.4 mm^2	44 mm^2	63 mm^2	Increase sample throughput—higher surface area lets you reduce extraction time and **analyze more samples per shift.**
Phase (PDMS) volume	0.6 µL	3.8 µL	12 µL	With significantly more phase, SPME Arrow provides better sensitivity so you can **lower detection limits with confidence.**

Our product line is continually expanding! See what's new at **www.restek.com/SPME**

On Target: Longer Lifetime

One of the main drawbacks to SPME fibers is their fragility. Even during routine use, they are easily damaged and can be irreparably broken (Figure 1). Busy labs will benefit greatly from the reliability of rugged Restek PAL SPME Arrow. The unique stainless-steel Arrow design includes a robust inner stabilizing rod that resists bending and breakage, as well as an outer sheath that protects the phase coating and prevents both physical damage and analyte loss. Typically, SPME Arrows perform well for hundreds of extractions, lasting 2–3 times longer than traditional SPME fibers. In addition, the unique arrow-shaped tip pierces the septum cleanly and with little resistance, extending septum lifetime (Figure 2).

Figure 1: SPME fibers break easily during routine operation.

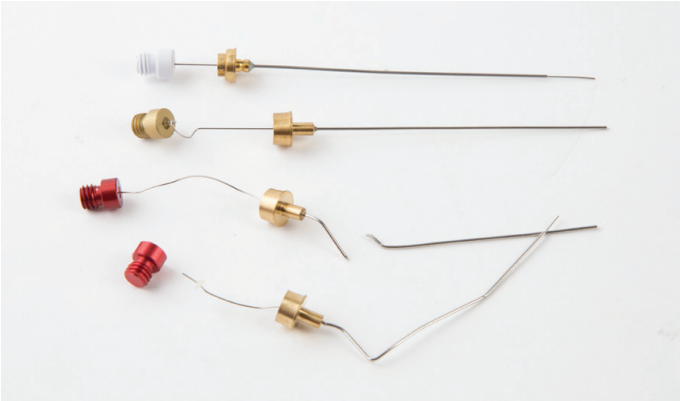
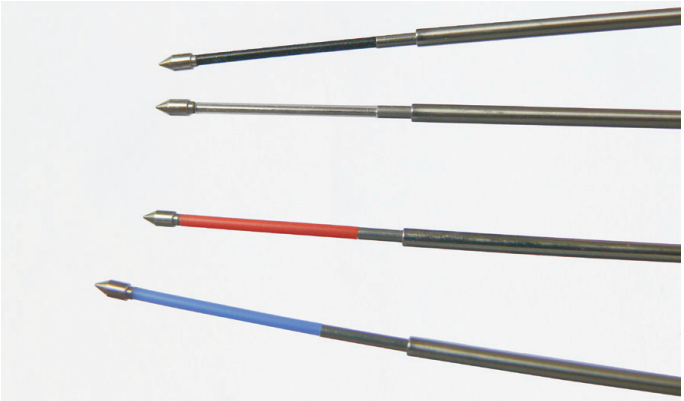


Figure 2: The rugged construction of the Restek PAL SPME Arrow prevents breakage under normal use.



Which Restek PAL SPME Arrow is best for my application?

Restek PAL SPME Arrows are suitable for a wide range of analyte chemistries and sample matrices. They are suitable for manual injection and compatible with PAL3 autosamplers. Choose the best SPME Arrow for your application based on the properties of your target compounds.

- Trace analysis in foodstuffs
- Drugs and pharmaceuticals
- Herbicides/pesticides
- Medical diagnostics
- Trace impurities in polymers and solid samples
- Solvent residues in raw materials
- Water analysis (organics in water)

Restek PAL SPME Arrow

- Rugged stainless-steel construction ensures longer lifetimes.
- Faster extraction means higher sample throughput.
- Better sensitivity allows lower LODs.

Recommended maximum GC inlet pressure is 50 psi or less.

All Restek PAL SPME Arrows have 20 mm of phase bonded onto stainless steel.

Description	Color	Diameter	Material	Recommended Analytes	qty.	cat.#
SPME Arrow	Red	1.1 mm	100 µm Polydimethylsiloxane (PDMS)	Volatile, 60–275 g/mol*	ea.	27485
	Red	1.5 mm wide sleeve	100 µm Polydimethylsiloxane (PDMS)	Volatile, 60–275 g/mol*	ea.	27877
	Black	1.5 mm	250 µm Polydimethylsiloxane (PDMS)	Volatile, 60–275 g/mol (high capacity)*	ea.	27484
	Gray	1.1 mm	100 µm Polyacrylate	Polar, semivolatile, 80–300 g/mol*	ea.	27488
	Light Blue	1.1 mm	120 µm Carbon Wide Range (WR)/PDMS	Highly volatile, 30–225 g/mol*	ea.	27487
	Light Blue	1.5 mm wide sleeve	120 µm Carbon Wide Range (WR)/PDMS	Highly volatile, 30–225 g/mol*	ea.	27879
	Violet	1.1 mm	120 µm Divinylbenzene (DVB)/PDMS	Amines and polar compounds, 60–300 g/mol*	ea.	27486
	Violet	1.5 mm wide sleeve	120 µm Divinylbenzene (DVB)/PDMS	Aromatic semivolatile, 60–300 g/mol*	ea.	27878
	Dark Gray	1.1 mm	120 µm DVB/Carbon WR/PDMS	Volatile and semivolatile, 40–275 g/mol*	ea.	27875
	Dark Gray	1.5 mm wide sleeve	120 µm DVB/Carbon WR/PDMS	Volatile and semivolatile, 40–275 g/mol*	ea.	27876
SPME Arrow Method Development Kit Includes: one SPME arrow each: 1.1 mm PDMS 100 µm, 1.5 mm PDMS 250 µm, 1.1 mm PA 100 µm, 1.1 mm Carbon WR/PDMS 120 µm, 1.1 mm DVB/PDMS 120 µm					Set of 5	27489

*These molecular weight ranges are a reasonable approximation; however, end users should verify suitability for their specific application.
Due to the relatively large diameter of Restek PAL SPME Arrows, you must modify the GC inlet using an instrument-specific conversion kit from Restek prior to use.

On Target: Higher Sample Throughput

Restek PAL SPME Arrows provide much faster extraction times than traditional SPME fibers because Arrows have much more phase volume. As shown in Figure 3, the increased phase volume allows more target analyte to be extracted in just seconds using an Arrow than can be extracted from a traditional fiber. Being able to extract what you need in a fraction of the time means more samples can be analyzed per day, which improves lab efficiency and profitability. The example in Table II demonstrates a nearly 50% increase in productivity!

Figure 3: Benchmark Comparison of 1.1 mm SPME Arrow vs. Standard SPME Fiber for 2.5 ppb Volatiles in Headspace

Increase sample throughput by extracting more analyte in less time. With SPME Arrow, you can extract twice the amount in 15 sec than you can in 120 sec using a traditional fiber.

Arrow and fiber both have 100 µm PDMS coatings. Data points are replicate averages of summed responses of approximately 90 volatile compounds at each extraction time.

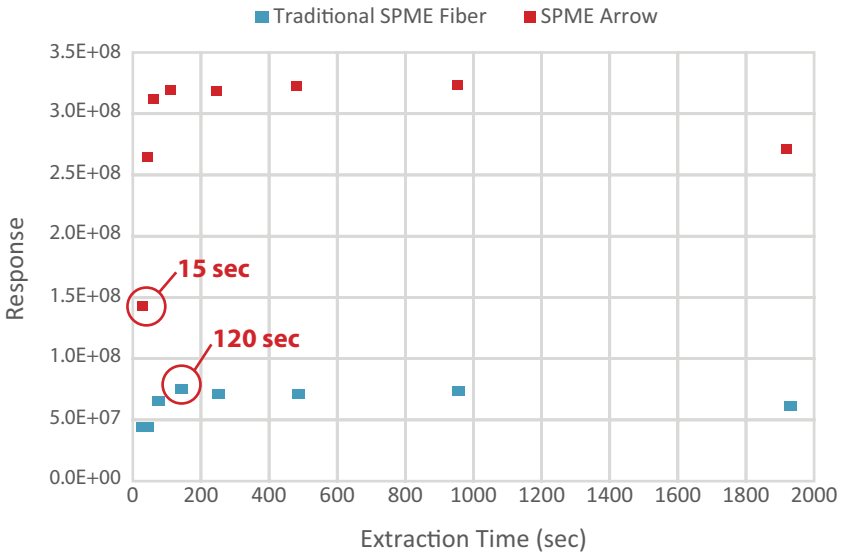


Table II: Analyze more samples per day with Restek PAL SPME Arrow.

	Sample Collection and Desorption Steps with Associated Times (sec)								
Target Analytes	**Select Sample Vial**	**Vial Incubation / Fiber Conditioning**	**Vial Transfer**	**Sample Extraction (Headspace)**	**GC Equilibration**	**Desorb Fiber**	**Return Sample Vial**	**Total Time**	**Samples per Day**
Traditional SPME Fiber	22	120	20	**120**	15	10	15	322	**268**
SPME Arrow	22	120	20	**15**	15	10	15	217	**398** (~50% increase)

Note: Processes that take <10 sec to perform were omitted from the table. Actual samples per day is dependent on GC cycle time.

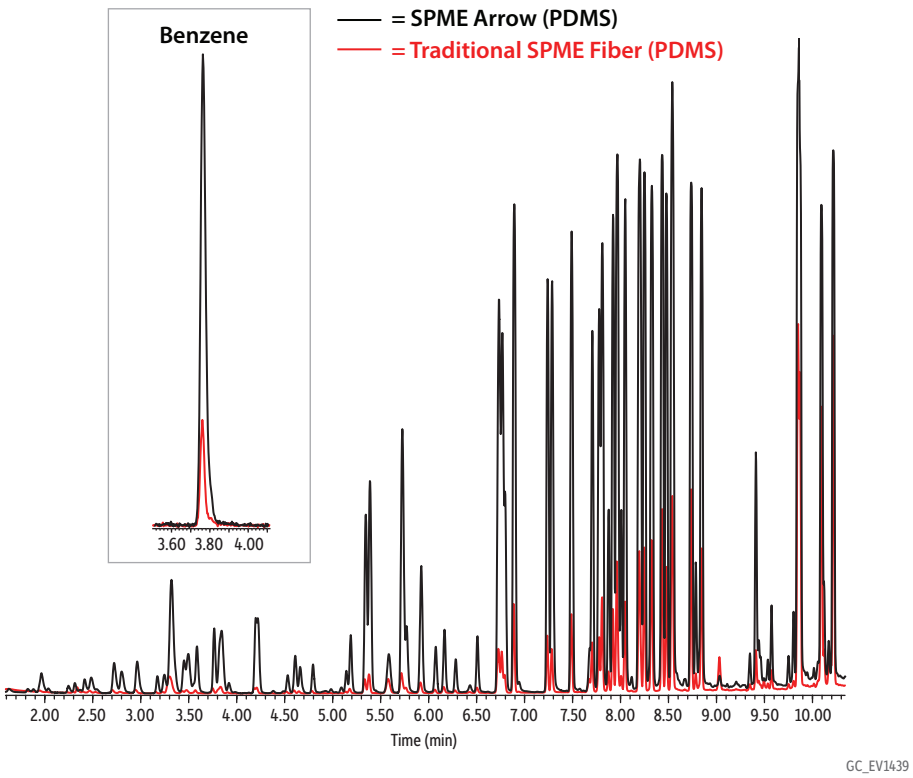
On Target: Lower Detection Limits

Developing a new method or trying to improve the performance of an existing one? Restek PAL SPME Arrows have more phase volume, so they provide much greater sensitivity than traditional fibers. To demonstrate this, 82 volatile compounds were analyzed under three different headspace extraction time and extraction volume combinations. Results under all experimental conditions definitively show that Arrow outperforms traditional SPME fiber and provides much higher analyte responses (Table III and Figure 4).

Table III: Analyte response is much higher with SPME Arrow than with a traditional SPME fiber.

		Average % Increase in Response of Arrow vs. Traditional Fiber	
Extraction Time (min)	Extraction Volume (mL Water)	1.1 mm Arrow	1.5 mm Arrow
10	10	297%	527%
5	10	618%	896%
10	5	446%	634%

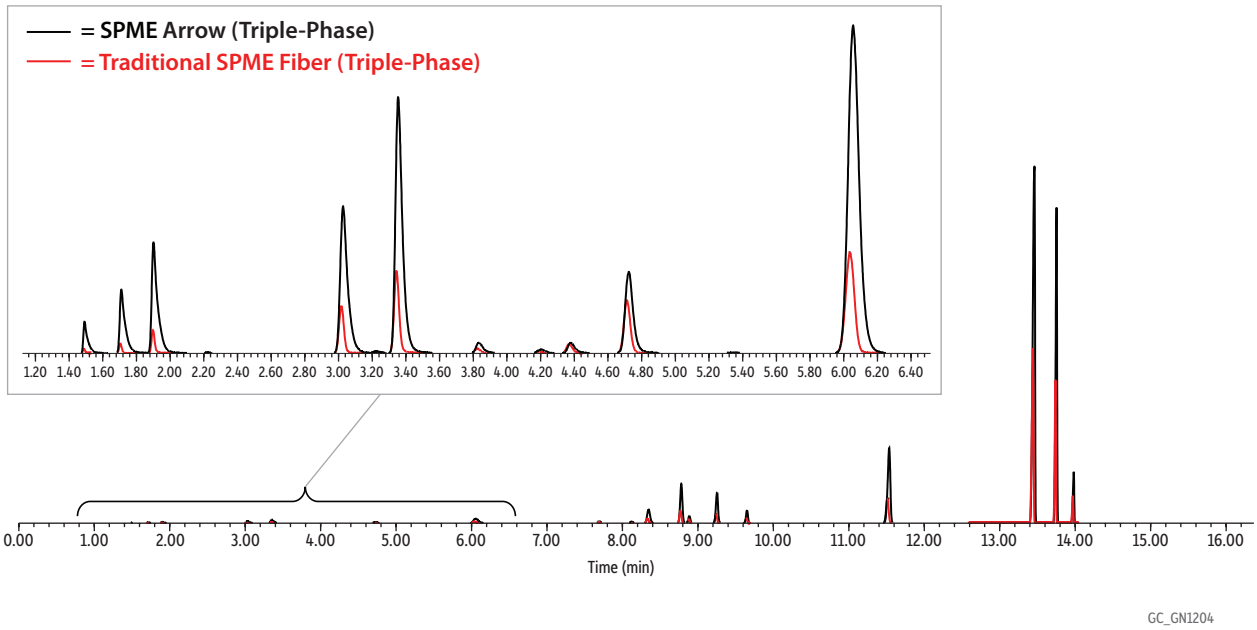
Figure 4: Restek PAL SPME Arrow extracts more target analyte from samples, allowing lower detection limits.



Total ion chromatogram (TIC). Black trace = 1.1 mm Arrow. Red trace = traditional SPME fiber.
Both were 100 µm PDMS run under identical headspace extraction, desorption, and analytical conditions.

Turning to the emerging cannabis market and the triple-phase (DVB/Carbon WR/PDMS) Arrow, you can also expect significantly higher analyte responses with residual solvents and other classes of compound (Figure 5).

Figure 5: Restek PAL SPME Arrow provides similarly superior results for residual solvents and other compounds.



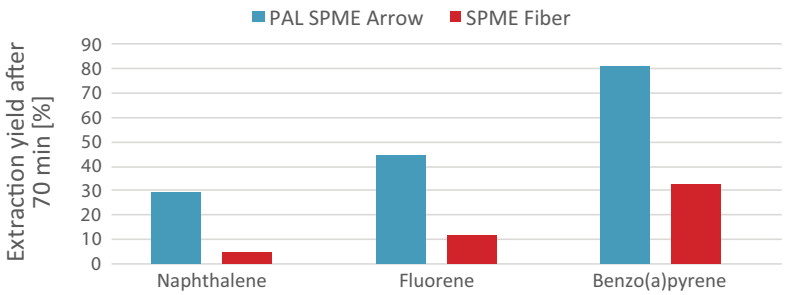
Total ion chromatogram (TIC). Black trace = 1.1 mm 120 µm Arrow. Red trace = traditional 80 µm SPME fiber. Both were triple-phase (DVB/Carbon WR/PDMS) run under identical headspace extraction, desorption, and analytical conditions.

Even after 70 minutes of immersion extraction, the compound concentration of PAHs for the traditional SPME fiber could not equal the amount obtained using a SPME Arrow (Figure 6).

Figure 6: Traditional SPME fibers cannot match the extraction yield of SPME Arrows (immersion extraction technique).

SPME Arrows extract more analyte so you can lower LODs with confidence.

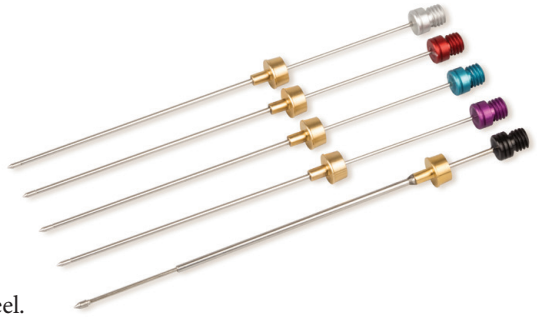
Arrow and fiber both have 100 µm PDMS coatings. Analytes were at 50 ng/L.



Switch to SPME Arrow and Set Your Sights on Superior Performance!

Get set up for Superior SPME!

Restek PAL SPME Arrow



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All Restek PAL SPME Arrows have 20 mm of phase bonded onto stainless steel.

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SPME Arrow	Red	1.1 mm	100 µm Polydimethylsiloxane (PDMS)	Volatile, 60–275 g/mol*	ea.	27485
	Red	1.5 mm wide sleeve	100 µm Polydimethylsiloxane (PDMS)	Volatile, 60–275 g/mol*	ea.	27877
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	Violet	1.1 mm	120 µm Divinylbenzene (DVB)/PDMS	Amines and polar compounds, 60–300 g/mol*	ea.	27486
	Violet	1.5 mm wide sleeve	120 µm Divinylbenzene (DVB)/PDMS	Aromatic semivolatile, 60–300 g/mol*	ea.	27878
	Dark Gray	1.1 mm	120 µm DVB/Carbon WR/PDMS	Volatile and semivolatile, 40–275 g/mol*	ea.	27875
	Dark Gray	1.5 mm wide sleeve	120 µm DVB/Carbon WR/PDMS	Volatile and semivolatile, 40–275 g/mol*	ea.	27876
SPME Arrow Method Development Kit Includes: one SPME arrow each: 1.1 mm PDMS 100 µm, 1.5 mm PDMS 250 µm, 1.1 mm PA 100 µm, 1.1 mm Carbon WR/PDMS 120 µm, 1.1 mm DVB/PDMS 120 µm					Set of 5	27489

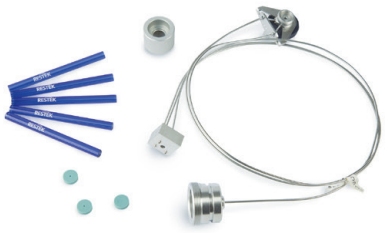
*These molecular weight ranges are a reasonable approximation; however, end users should verify suitability for their specific application.
Due to the relatively large diameter of Restek PAL SPME Arrows, you must modify the GC inlet using an instrument-specific conversion kit from Restek prior to use.

Restek PAL SPME Manual Injection Kit

Designed to house SPME Arrows (1.1 and 1.5 mm) and traditional SPME fibers during extraction and injection steps.

Description	Includes	qty.	cat.#
Restek PAL SPME Manual Injection Kit	SPME manual holder, SPME manual extraction guide, SPME manual injection guide	kit	27490

27490



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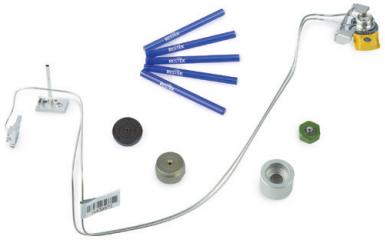

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Restek PAL SPME Arrow GC-Specific Conversion Kits

Conversion kits designed for use with 1.1 and 1.5 mm Restek PAL SPME Arrows. **Due to the relatively large diameter of Restek PAL SPME Arrows, you must modify the GC inlet using an instrument-specific conversion kit prior to use.**

Description	Includes	Instrument	qty.	cat.#
Restek PAL SPME Arrow Conversion Kit	Topaz 1.8 mm ID straight/SPME inlet liner, 5-pk. (cat.# 23280); Thermolite Plus septa, 3-pk. (cat.# 23864); Split/splitless weldment; large, canister-type filter (cat.# 27502); Septum nut for 6890 split/splitless weldments (cat.# 27503); Injector adaptor cup (cat.# 27496)	for Agilent 6890 Split/ Splitless Injector (for canister-type filters)	kit	27492
Restek PAL SPME Arrow Conversion Kit with 1.1 mm Merlin Microseal	Topaz 1.8 mm ID Straight/SPME inlet liner, 5-pk. (cat.# 23280); 1.1 mm Microseal (cat.# 23232); Split/Splitless Weldment; Large Canister Type Filter (cat.# 27502); Adaptor Cup (cat.# 27496); Nut (cat.# 23228)	for Agilent 6890 Split/ Splitless Injector (for canister-type filters)	kit	27356
Restek PAL SPME Arrow Conversion Kit with 1.5 mm Merlin Microseal	Topaz 1.8 mm ID Straight/SPME inlet liner, 5-pk. (cat.# 23280); 1.5 mm Microseal (cat.# 23233); Split/Splitless Weldment and Large Canister Type Filter (cat.# 27502); Adaptor Cup (cat.# 27496); Nut (cat.# 23228)	for Agilent 6890 Split/ Splitless Injector (for canister-type filters)	kit	27361
Restek PAL SPME Arrow Conversion Kit	Topaz 1.8 mm ID straight/SPME inlet liner, 5-pk. (cat.# 23280); Thermolite Plus septa, 3-pk. (cat.# 23864); Agilent split/splitless weldment and septum nut (cat.# 27504); Injector adaptor cup (cat.# 27496)	for Agilent 7890 Split/ Splitless Injector	kit	27493
Restek PAL SPME Arrow Conversion Kit with 1.1 mm Merlin Microseal	Topaz 1.8 mm ID Straight/SPME inlet liner, 5-pk. (cat.# 23280); 1.1 mm Microseal (cat.# 23232); Agilent Weldment (cat.# 27504); Adaptor Cup (cat.# 27496); Nut (cat.# 23228)	for Agilent 7890 Split/ Splitless Injector	kit	27357
Restek PAL SPME Arrow Conversion Kit with 1.5 mm Merlin Microseal	Topaz 1.8 mm ID Straight/SPME inlet liner, 5-pk. (cat.# 23280); 1.5 mm Microseal (cat.# 23233); Agilent Weldment (cat.# 27504); Adaptor Cup (cat.# 27496); Nut (cat.# 23228)	for Agilent 7890 Split/ Splitless Injector	kit	27362
Restek PAL SPME Arrow Conversion Kit	Topaz 1.8 mm ID straight/SPME inlet liner, 5-pk. (cat.# 23279); Thermolite Plus septa, 3 pk. (cat.# 23872); Injection port weldment (cat.# 27500); Needle guide/septum nut (cat.# 27501); Injector adaptor cup (cat.# 27497)	for Shimadzu GC-2010 Split/Splitless Injector (not compatible with SE or Plus models)	kit	27491
Restek PAL SPME Arrow Conversion Kit with 1.1 mm Merlin Microseal	Topaz 1.8 mm ID Straight/SPME inlet liner, 5-pk. (cat.# 23279); 1.1 mm Microseal (cat.# 23232); Port Weldment (cat.# 27500); Adaptor Cup (cat.# 27497); Adaptor Kit (cat.# 23229)	for Shimadzu GC-2010 Split/Splitless Injector (not compatible with SE or Plus models)	kit	27355
Restek PAL SPME Arrow Conversion Kit with 1.5 mm Merlin Microseal	Topaz 1.8 mm ID Straight/SPME inlet liner, 5-pk. (cat.# 23279); 1.5 mm Microseal (cat.# 23233); Port Weldment (cat.# 27500); Adaptor Cup (cat.# 27497); Adaptor Kit (cat.# 23229)	for Shimadzu GC-2010 Split/Splitless Injector (not compatible with SE or Plus models)	kit	27360
Restek PAL SPME Arrow Conversion Kit	Topaz 1.8 mm ID straight/SPME inlet liner, 5-pk. (cat.# 23278); Premium nonstick BTO septa, 3-pk. (cat.# 27090); Septum cap (cat.# 27505); Liner cap/septum holder (cat.# 27506); Injector adaptor cup (cat.# 27498)	for Thermo TRACE 1300/1310 Split/Splitless Injector	kit	27494
Restek PAL SPME Arrow Conversion Kit with 1.1 mm Merlin Microseal	Topaz 1.8 mm ID Straight/SPME inlet liner, 5-pk. (cat.# 23278); 1.1 mm Microseal (cat.# 23232); Liner Cap/Septum Holder (cat.# 27506); Adaptor Cup (cat.# 27498); Nut (cat.# 23230)	for Thermo TRACE 1300/1310 Split/Splitless Injector	kit	27358
Restek PAL SPME Arrow Conversion Kit with 1.5 mm Merlin Microseal	Topaz 1.8 mm ID Straight/SPME inlet liner, 5-pk. (cat.# 23278); 1.5 mm Microseal (cat.# 23233); Liner Cap/Septum Holder (cat.# 27506); Adaptor Cup (cat.# 27498); Adaptor Kit (cat.# 23230)	for Thermo TRACE 1300/1310 Split/Splitless Injector	kit	27363
Restek PAL SPME Arrow Conversion Kit	2.0 mm ID straight inlet liner, 5-pk. (cat.# 22267); Premium nonstick BTO septa, 3-pk. (cat.# 27096); Septum holder and support (cat.# 27507); Liner cap (cat.# 27508); Injector adaptor cup (cat.# 27499)	for Thermo TRACE Ultra Split/Splitless Injector	kit	27495
Restek PAL SPME Arrow Conversion Kit with 1.1 mm Merlin Microseal	2.0 mm ID straight inlet liner, 5-pk. (cat.# 22267); 1.1 mm Microseal (cat.# 23232); Liner Cap (cat.# 27508); Adaptor Cup (cat.# 27499); Adaptor Kit (cat.# 23231)	for Thermo TRACE Ultra Split/Splitless Injector	kit	27359
Restek PAL SPME Arrow Conversion Kit with 1.5 mm Merlin Microseal	2.0 mm ID straight inlet liner, 5-pk. (cat.# 22267); 1.5 mm Microseal (cat.# 23233); Liner Cap (cat.# 27508); Adaptor Cup (cat.# 27499); Adaptor Kit (cat.# 23231)	for Thermo TRACE Ultra Split/Splitless Injector	kit	27364

Accessories for SPME Arrows

Description	Instrument	qty.	cat.#
Injector adaptor cup	for Agilent GC 6890/7890 Split/Splitless Injector	ea.	27496
	for Shimadzu GC 2010 Split/Splitless Injector	ea.	27497
	for Thermo GC TRACE 1300/1310 Split/Splitless Injector	ea.	27498
	for Thermo GC TRACE Ultra Split/Splitless Injector	ea.	27499
Injection port weldment	for Shimadzu GC 2010 Split/Splitless Injector	ea.	27500
Needle guide/septum nut	for Shimadzu GC 2010 Split/Splitless Injector	ea.	27501
Split/splitless weldment; large, canister-type filter	for Agilent GC 6890 Split/Splitless Injector	ea.	27502
Septum nut for split/splitless weldments	for Agilent GC 6890/7890 Split/Splitless Injector	ea.	27503
Split/splitless weldment and septum nut	for Agilent GC 7890 Split/Splitless Injector	ea.	27504
Septum cap	for Thermo GC TRACE 1300/1310 Split/Splitless Injector	ea.	27505
Liner cap/septum holder	for Thermo GC TRACE 1300/1310 Split/Splitless Injector	ea.	27506
Septum holder and support	for Thermo GC TRACE Ultra Split/Splitless Injector	ea.	27507
Liner cap	for Thermo GC TRACE Ultra Split/Splitless Injector	ea.	27508

27496

27503

27508

SPME Performance Test Mix

(2 components)

- Essential mix for establishing the performance of SPME fibers and SPME Arrows.
- Verified composition and stability.

Certified reference materials (CRMs) manufactured and QC tested in ISO-accredited labs satisfy your ISO requirements.

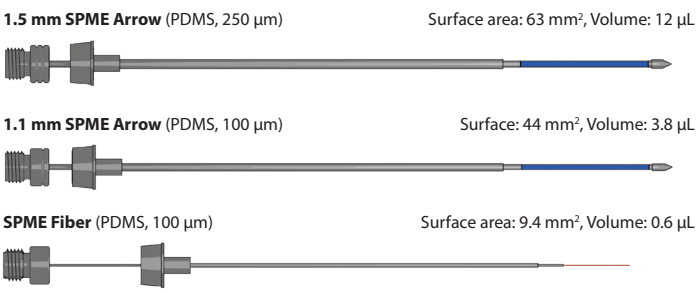
Nitrobenzene (98-95-3)

2-Nitrotoluene (88-72-2)

Conc. in Solvent	Certified Reference Material?	Min Shelf Life on Ship Date	Max Shelf Life on Ship Date	cat.#
SPME Performance Test Mix				
1 µg/mL in water:methanol (99:1), 1 mL/ampul	Yes	6 months	36 months	31015 (3-pk.)

More phase volume and robust construction mean Restek PAL SPME Arrows outperform traditional fibers.

- Rugged stainless-steel construction ensures longer lifetimes.
- Faster extraction increases productivity.
- Better sensitivity for lower LODs.



GC Inlet Liners for SPME

Topaz 1.8 mm ID Straight/SPME Inlet Liner

for Shimadzu 17A, 2010, 2014, and 2030 GCs equipped with split/splitless inlets

Geometry	Deactivation	Material	ID x OD x Length	qty	cat.#
Straight/SPME	Premium	Borosilicate Glass	1.8 mm x 5.0 mm x 95 mm	5-pk.	23279

Topaz 1.8 mm ID Straight/SPME Inlet Liner

for Thermo TRACE 1300/1310 GCs equipped with SSL inlets

Geometry	Deactivation	Material	ID x OD x Length	qty	Similar to Part #	cat.#
Straight/SPME	Premium	Borosilicate Glass	1.8 mm x 6.5 mm x 78.5 mm	5-pk.	Thermo 453A0415-UI	23278

Topaz 1.8 mm ID Straight/SPME Inlet Liner

for Agilent GCs equipped with split/splitless inlets

Geometry	Deactivation	Material	ID x OD x Length	qty	cat.#
Straight/SPME	Premium	Borosilicate Glass	1.8 mm x 6.5 mm x 78.5 mm	5-pk.	23280

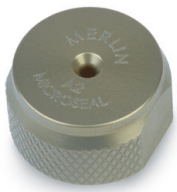
2.0 mm ID Straight Inlet Liner

for Thermo TRACE, 8000 Series, and Focus GCs equipped with SSL inlets

Geometry	Deactivation	Material	ID x OD x Length	qty	cat.#
Straight	Standard	Borosilicate Glass	2.0 mm x 8.0 mm x 105 mm	5-pk.	22267

* 100% SATISFACTION GUARANTEE: If your Topaz inlet liner does not perform to your expectations for any reason, simply contact Restek Technical Service or your local Restek representative and provide a sample chromatogram showing the problem. If our GC experts are not able to quickly and completely resolve the issue to your satisfaction, you will be given an account credit or replacement product (same cat.#) along with instructions for returning any unopened product. (Do not return product prior to receiving authorization.) For additional details about Restek's return policy, visit www.restek.com/warranty

Merlin Microseals for SPME Arrow



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Merlin Microseal Nut for SPME Arrow for Agilent GCs

Description	Includes	Instrument	Type	Vendor cat.#	qty.	cat.#
Merlin Microseal Nut for SPME Arrow	nut (1)	for Agilent GCs	SPME Arrow Application Nut (3 to 100 psi)	1000AG	ea.	23228

Merlin Microseal Adaptor Kit for SPME Arrow for Shimadzu 2010, 2025, and 2030 GCs

Description	Includes	Instrument	Type	Vendor cat.#	qty.	cat.#
Merlin Microseal Adaptor Kit for SPME Arrow	nut (1); adaptor (1); O-rings (4)	for Shimadzu 2010, 2025, and 2030 GCs	SPME Arrow Application Adaptor Kit (3 to 100 psi)	1000SH	kit	23229

Merlin Microseal Nut for SPME Arrow for Thermo TRACE 1300 and 1310 GCs

Description	Includes	Instrument	Type	Vendor cat.#	qty.	cat.#
Merlin Microseal Nut for SPME Arrow	nut (1)	for Thermo TRACE 1300 and 1310 GCs	SPME Arrow Application Nut (3 to 100 psi)	1000TS	ea.	23230

Merlin Microseal Adaptor Kit for SPME Arrow for Thermo TRACE Ultra GCs

Description	Includes	Instrument	Type	Vendor cat.#	qty.	cat.#
Merlin Microseal Adaptor Kit for SPME Arrow	nut (1); adaptors (3); O-rings (4)	for Thermo TRACE Ultra GCs	SPME Arrow Application Adaptor Kit (3 to 100 psi)	1000TU	kit	23231

Merlin Microseal Replacement Septa

Description	Type	Vendor cat.#	qty.	cat.#
Replacement Microseal	General-Purpose Microseal (most applications, 3 to 100 psi)	410	ea.	22812
	Low-Pressure Microseal (1 to 45 psi)	310	ea.	22815
	Microseal for Traditional SPME Fiber Applications (3 to 100 psi)	21-01	ea.	22782
	Microseal for 1.1 mm SPME Arrow Applications (3 to 100 psi)	1100	ea.	23232
	Microseal for 1.5 mm SPME Arrow Applications (3 to 100 psi)	1500	ea.	23233
	Microseal for 26 gauge or 23/26 gauge tapered needles (5 to 100 psi)	610	ea.	22264

SPME Vials, Caps, and Septa

Magnetic Screw-Thread Caps, 18 mm

Description	Type	Cap Size	Septa Material	qty.	cat.#
Magnetic Caps and Septa for SPME	Screw-Thread	18-425	Blue PTFE/Silicone, 1.5 mm thick	100-pk.	23090
	Screw-Thread	18-425	Blue PTFE/Silicone, 1.5 mm thick	1,000-pk.	23091
Magnetic Caps and Septa	Screw-Thread	18-425	Red PTFE/Silicone, 1.9 mm thick	100-pk.	23092
	Screw-Thread	18-425	Red PTFE/Silicone, 1.9 mm thick	1,000-pk.	23093
	Screw-Thread	18-425	PTFE/Red Chlorobutyl	100-pk.	23094
	Screw-Thread	18-425	PTFE/Red Chlorobutyl	1,000-pk.	23095


23091

SPME MicroCenter Caps and Septa

Description	Type	Cap Size	Color	Septa Material	qty.	cat.#
SPME Vial Cap	Screw-Thread	18-425		MicroCenter PTFE/Silicone, 0.040" (+/-0.005")	100-pk.	23852
	Screw-Thread	18-425		MicroCenter PTFE/Silicone, 0.040" (+/-0.005")	1,000-pk.	23853
	Bi-Metal Crimp	20 mm	Blue	MicroCenter PTFE/Silicone, 0.065" (+/-0.005")	100-pk.	23854
	Bi-Metal Crimp	20 mm	Blue	MicroCenter PTFE/Silicone, 0.065" (+/-0.005")	1,000-pk.	23855
	Bi-Metal Crimp	20 mm	Red	MicroCenter PTFE/Silicone, 0.065" (+/-0.005")	100-pk.	23856
	Bi-Metal Crimp	20 mm	Red	MicroCenter PTFE/Silicone, 0.065" (+/-0.005")	1,000-pk.	23857
	Steel Crimp	20 mm	Gold	MicroCenter PTFE/Silicone, 0.065" (+/-0.005")	100-pk.	23858
	Steel Crimp	20 mm	Gold	MicroCenter PTFE/Silicone, 0.065" (+/-0.005")	1,000-pk.	23859
SPME Vial Septa, 18 mm				MicroCenter PTFE/Silicone, 0.040" (+/-0.005")	100-pk.	23850
				MicroCenter PTFE/Silicone, 0.040" (+/-0.005")	1,000-pk.	23851


23852


23854

Cat.# 23850 and 23851 not for use with 20 mm caps.

Headspace Crimp Vials, 20 mm

Description	Modification	Type	Volume	Color	Deactivation	Size	qty.	cat.#
Headspace Vial Flat Bottom	Flat Bottom	20 mm Crimp-Top	6 mL	Clear		22 x 38 mm	100-pk.	21166
	Flat Bottom	20 mm Crimp-Top	6 mL	Clear		22 x 38 mm	1,000-pk.	21167
	Flat Bottom	20 mm Crimp-Top	10 mL	Clear		23 x 46 mm	100-pk.	24683
	Flat Bottom	20 mm Crimp-Top	10 mL	Clear		23 x 46 mm	1,000-pk.	24684
Headspace Vial Rounded Bottom	Rounded Bottom	20 mm Crimp-Top	10 mL	Clear		23 x 46 mm	100-pk.	21164
	Rounded Bottom	20 mm Crimp-Top	10 mL	Clear		23 x 46 mm	1,000-pk.	21165
	Rounded Bottom	20 mm Crimp-Top	10 mL	Clear	Deactivated	23 x 46 mm	1,000-pk.	21165-221
Headspace Vial Flat Bottom	Flat Bottom	20 mm Crimp-Top	20 mL	Clear		23 x 75 mm	100-pk.	24685
	Flat Bottom	20 mm Crimp-Top	20 mL	Clear		23 x 75 mm	1,000-pk.	24686
Headspace Vial Rounded Bottom	Rounded Bottom	20 mm Crimp-Top	20 mL	Clear		23 x 75 mm	100-pk.	21162
	Rounded Bottom	20 mm Crimp-Top	20 mL	Clear		23 x 75 mm	1,000-pk.	21163
Headspace Vial Flat Bottom	Flat Bottom	20 mm Crimp-Top	27 mL	Clear		30 x 60 mm	100-pk.	21160
	Flat Bottom	20 mm Crimp-Top	27 mL	Clear		30 x 60 mm	1,000-pk.	21161


21166

Vial-to-instrument compatibility is designated in instrument reference chart.

Headspace Screw-Thread Vials, 18 mm

Description	Modification	Type	Volume	Color	Size	qty.	cat.#
Headspace Vial Rounded Bottom	Rounded Bottom	18-425 Screw-Thread	20 mL	Clear	22 x 75 mm	100-pk.	23082
	Rounded Bottom	18-425 Screw-Thread	20 mL	Clear	22 x 75 mm	1,000-pk.	23083
	Rounded Bottom	18-425 Screw-Thread	20 mL	Amber	22 x 75 mm	100-pk.	23086
	Rounded Bottom	18-425 Screw-Thread	20 mL	Amber	22 x 75 mm	1,000-pk.	23087
	Rounded Bottom	18-425 Screw-Thread	10 mL	Clear	22 x 45 mm	100-pk.	23084
	Rounded Bottom	18-425 Screw-Thread	10 mL	Clear	22 x 45 mm	1,000-pk.	23085
	Rounded Bottom	18-425 Screw-Thread	10 mL	Amber	22 x 45 mm	100-pk.	23088
	Rounded Bottom	18-425 Screw-Thread	10 mL	Amber	22 x 45 mm	1,000-pk.	23089


23082

Caps not included (sold separately).

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