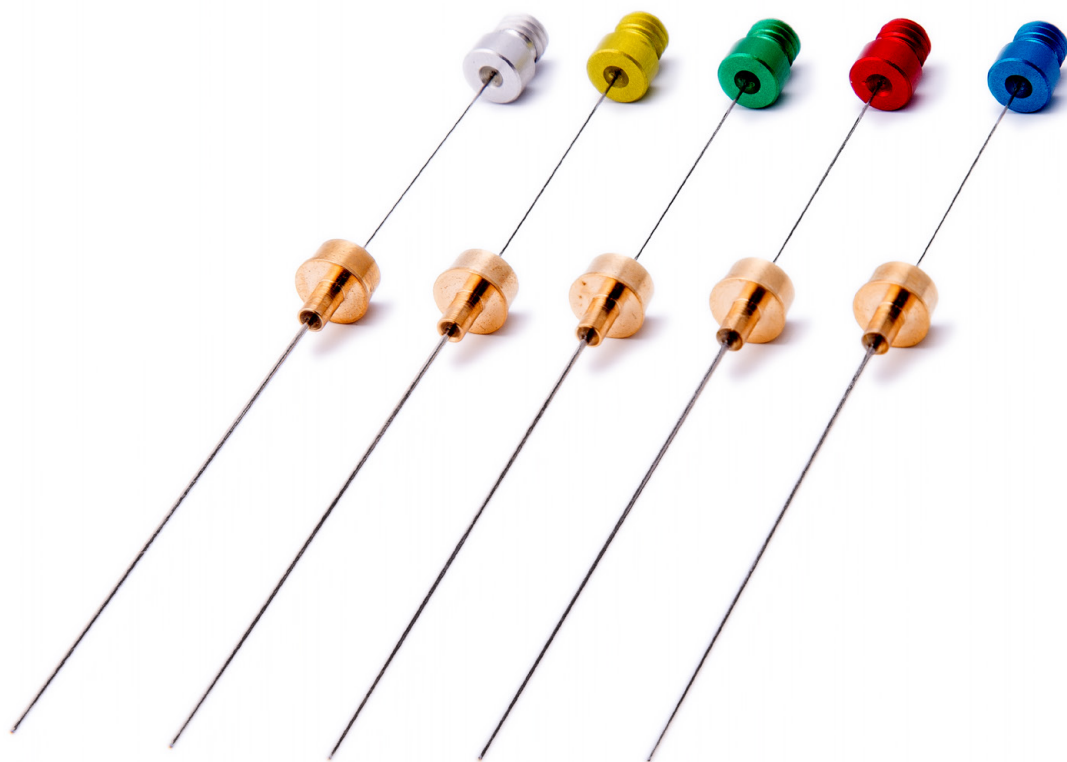


High-Performing Restek PAL SPME Fibers

- Suitable for a wide range of analyte chemistries and sample matrices.
- Reliable performance meets or exceeds other brands.
- Robust aluminum hub is more durable than plastic.
- Optimized for PAL system autosamplers and compatible with most GC inlets.



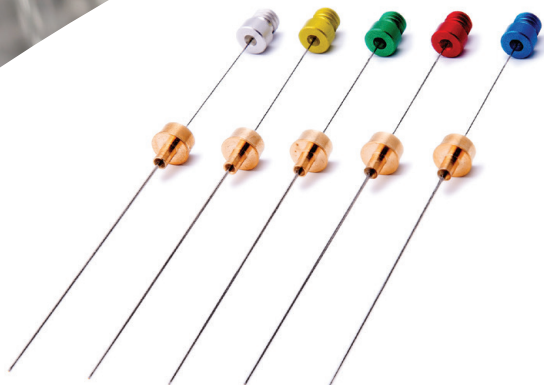


High-Performing SPME Fibers from Restek

Restek PAL SPME fibers deliver results that consistently meet or exceed the performance of other solid phase microextraction fibers. Our reliable SPME fibers are optimized for PAL system autosamplers and are compatible with most GC inlets. Restek PAL SPME fibers are ideal for many applications in environmental, food, clinical, and other industries.

Typical Applications

- Trace analysis in food
- Drugs and pharmaceuticals
- Herbicides/pesticides
- Medical diagnostics
- Organics in water
- Trace impurities in polymers and solid samples
- Solvent residues in raw materials



Which fiber is best for my application?

Restek PAL SPME fibers are suitable for a wide range of analyte chemistries and sample matrices. Choose the best SPME fiber for your application based on the properties of your target compounds. You can easily confirm the fiber type by the color of the hub that connects it to the injector.

Target Analytes	Molecular Weight	Recommended Fiber	Hub Color
Nonpolar	125–600	7 μm polydimethylsiloxane (PDMS)	Green
Nonpolar, semivolatile	80–500	30 μm polydimethylsiloxane (PDMS)	Golden
Volatile	60–275	100 μm polydimethylsiloxane (PDMS)	Red
Polar, semivolatile	80–300	85 μm Polyacrylate	Gray
Highly volatile	30–225	95 μm Carbon wide range (WR)/PDMS	Dark blue
Aromatic, semivolatile	50–300	65 μm Divinylbenzene (DVB)/PDMS	Violet
Volatile and semivolatile	40–275	80 μm DVB/Carbon WR/PDMS	Dark Gray

Restek PAL SPME Fibers Are Proven to Perform

A quantitative comparison of Restek PAL SPME fibers to a popular brand proves that Restek PAL SPME fibers perform as well as or better than the competition. In this comparison of 80 µm DVB/Carbon WR/PDMS triple-phase fibers, it is clear that comparable results were obtained for residual solvents in cannabis extracts.

Residual solvents analysis in cannabis extracts may be analyzed with a USP <467> approach. The data below were obtained by headspace (HS)–solid phase microextraction (SPME) on a 6 mL sample, prepared as follows:

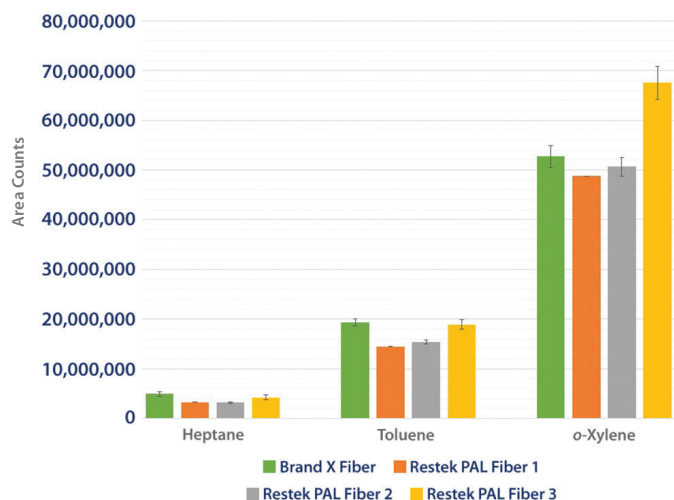
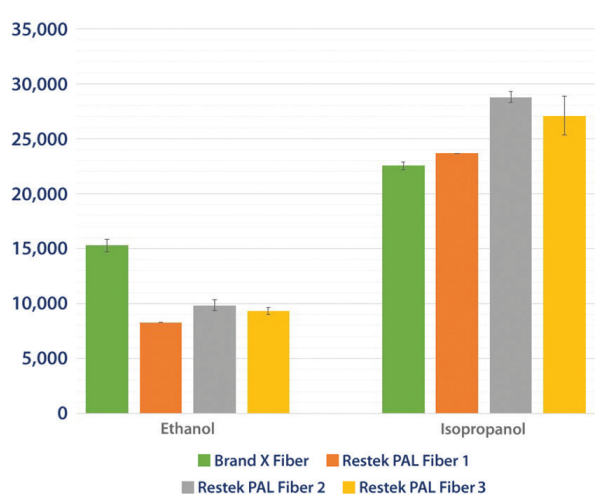
1. 3 g sodium chloride (NaCl) was measured into a 20 mL amber headspace vial (cat. # 23086) with screw top cap (cat. # 23090).
2. 6 mL of deionized (DI) water was then added to the vial.
3. Residual solvents (cat.# 34105) standard and *n*-propane, isobutane, *n*-butane (Emerald Scientific) standards were spiked at 10 µg/mL.
4. Everything was capped and vortexed at 3,000 rpm for 10 seconds, inverted, then vortexed again for 10 seconds at 3,000 rpm.

This sample was analyzed via the following parameters:

Test Parameters

- SPME Fibers: 80 µm DVB/Carbon WR/PDMS
- Extraction: 2 min in headspace at 30 °C with 1,000 rpm agitation
- Thermal Desorption: 10 sec at 250 °C
- Column: Rxi-624 Sil MS, 30 m x 0.25 mm x 1.40 µm (cat. # 13868)
- Oven Program: 30 °C (hold 3 min) to 85 °C (hold 2 min) at 15 °C/min to 250 °C at 35 °C/min
- Autosampler: PAL CTC RTC
- GC-MS: 7890 with 5977B HES MS

Restek PAL SPME fibers meet or exceed the performance of other brands residual solvents in cannabis extracts.



Get Set Up for SPME!

High-Performing SPME Fibers from Restek

Description	Color	Material	Max Temp	Recommended Operating Temp	qty.	cat.#	
SPME Fiber	Green	7 µm Polydimethylsiloxane (PDMS) Fiber, Nonpolar	340 °C	200–340 °C	ea.	27482.1	
	Green	7 µm Polydimethylsiloxane (PDMS) Fiber, Nonpolar	340 °C	200–340 °C	3-pk.	27482.3	
	Green	7 µm Polydimethylsiloxane (PDMS) Fiber, Nonpolar	340 °C	200–340 °C	5-pk.	27482.5	
	Golden	30 µm Polydimethylsiloxane (PDMS) Fiber, Nonpolar	280 °C	200–280 °C	ea.	27481.1	
	Golden	30 µm Polydimethylsiloxane (PDMS) Fiber, Nonpolar	280 °C	200–280 °C	3-pk.	27481.3	
	Golden	30 µm Polydimethylsiloxane (PDMS) Fiber, Nonpolar	280 °C	200–280 °C	5-pk.	27481.5	
	Red	100 µm Polydimethylsiloxane (PDMS) Fiber, Nonpolar	280 °C	200–280 °C	ea.	27480.1	
	Red	100 µm Polydimethylsiloxane (PDMS) Fiber, Nonpolar	280 °C	200–280 °C	3-pk.	27480.3	
	Red	100 µm Polydimethylsiloxane (PDMS) Fiber, Nonpolar	280 °C	200–280 °C	5-pk.	27480.5	
	Gray	85 µm Polyacrylate (PA) Fiber, Polar	280 °C	200–280 °C	ea.	27478.1	
	Gray	85 µm Polyacrylate (PA) Fiber, Polar	280 °C	200–280 °C	3-pk.	27478.3	
	Gray	85 µm Polyacrylate (PA) Fiber, Polar	280 °C	200–280 °C	5-pk.	27478.5	
	Dark Blue	95 µm Carbon Wide Range (WR)/PDMS Fiber	300 °C	220–300 °C	ea.	27479.1	
	Dark Blue	95 µm Carbon Wide Range (WR)/PDMS Fiber	300 °C	220–300 °C	3-pk.	27479.3	
	Dark Blue	95 µm Carbon Wide Range (WR)/PDMS Fiber	300 °C	220–300 °C	5-pk.	27479.5	
	Violet	65 µm Divinylbenzene (DVB)/PDMS Fiber	300 °C	220–300 °C	ea.	27874.1	
	Violet	65 µm Divinylbenzene (DVB)/PDMS Fiber	300 °C	220–300 °C	3-pk.	27874.3	
	Violet	65 µm Divinylbenzene (DVB)/PDMS Fiber	300 °C	220–300 °C	5-pk.	27874.5	
	Dark Gray	80 µm (50 DVB / 30 Carbon WR)/PDMS Fiber	300 °C	220–300 °C	ea.	27873.1	
	Dark Gray	80 µm (50 DVB / 30 Carbon WR)/PDMS Fiber	300 °C	220–300 °C	3-pk.	27873.3	
	Dark Gray	80 µm (50 DVB / 30 Carbon WR)/PDMS Fiber	300 °C	220–300 °C	5-pk.	27873.5	
	Method Development SPME Fiber Kit					Set of 5	27483
	Includes: one SPME fiber each: PDMS 7 µm, PDMS 30 µm, PDMS 100 µm, PA 85 µm, Carbon WR/PDMS 95 µm						

Recommended maximum GC inlet pressure is 50 psi or less.

All Restek PAL SPME fibers are 10 mm in length and are housed in a 23-gauge needle. The phase is bonded onto a fused silica fiber core.

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



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.)



GC Inlet Liners for SPME

Topaz GC inlet liners feature revolutionary technology and inertness to deliver you the next level of True Blue Performance:

Deactivation—unbelievably low breakdown for accurate and precise low-level GC analyses.

Reproducibility—unbeatable manufacturing controls and QC testing for superior reliability across compound classes.

Productivity—unparalleled cleanliness for maximized GC uptime and lab throughput.

100% Satisfaction—if a liner doesn't perform to your expectations, we will replace it or credit your account.*

Patented



Topaz 1.8 mm ID Straight/SPME Inlet Liner

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

ID x OD x Length	qty	cat.#
Straight/SPME, Premium Deactivation, 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 Agilent GCs equipped with split/splitless inlets

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

* 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



Topaz 1.8 mm ID Straight/SPME Inlet Liner

for Thermo TRACE 1300/1310 GCs equipped with SSL inlets

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



2.0 mm ID Straight Inlet Liner

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

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





22781



22972



22642



22810



22779



22812

Merlin Microseal Kits

- Eliminates septum coring and prolongs septum life.
- Consistently low needle-insertion force.
- Simple installation with no injection port modification.

Merlin Microseal Septa

for PerkinElmer GCs

Description	Includes	Instrument	Type	Vendor cat.#	qty.	cat.#
Merlin Microseal Septa	nut (1); adaptor (1); O-ring; general-purpose (#410) Microseals (2)	for PerkinElmer GCs	General-Purpose Kit (3 to 100 psi)	51-12	kit	22781

Merlin Microseal Septa

for Shimadzu GCs

Description	Includes	Instrument	Type	Vendor cat.#	qty.	cat.#
Merlin Microseal Septa	nut (1); adaptor (1); O-ring; general-purpose (#410) Microseals (2)	for Shimadzu GCs	General-Purpose Kit (3 to 100 psi)	61-12	kit	22972

Merlin Microseal Septa

for Thermo TRACE 1300 and 1310 GCs

Description	Includes	Instrument	Type	Vendor cat.#	qty.	cat.#
Merlin Microseal Septa	nut (1); general-purpose (#410) Microseals (2)	for Thermo 1300 and 1310 GCs	General-Purpose Kit (3 to 100 psi)	81-12	kit	22642

Merlin Microseal Septa

for Agilent GCs

Description	Includes	Instrument	Type	Vendor cat.#	qty.	cat.#
Merlin Microseal Septa	nut (1); general-purpose (#410) Microseals (2)	for Agilent GCs	General-Purpose Kit (3 to 100 psi), 2 Seals	404	kit	22810
	nut (1); general-purpose (#410) Microseal (1)	for Agilent GCs	General-Purpose Kit (3 to 100 psi), 1 Seal	405	kit	22811
	nut (1); low-pressure (#310) Microseals (2)	for Agilent GCs	Low-Pressure Kit (1 to 45 psi), 2 Seals	304	kit	22813
	nut (1); low-pressure (#310) Microseal (1)	for Agilent GCs	Low-Pressure Kit (1 to 45 psi), 1 Seal	305	kit	22814

Merlin Microseal Septa

for Bruker/Varian GCs

Description	Includes	Instrument	Type	Vendor cat.#	qty.	cat.#
Merlin Microseal Septa	nut (1); adaptor (1); O-ring; general-purpose (#410) Microseal (1)	for Bruker/Varian 1078/1079 GCs	General-Purpose Kit	21-11	kit	22779
	nut (1); adaptor (1); O-ring; general-purpose (#410) Microseal (1)	for Bruker/Varian 1177 GCs	General-Purpose Kit	22-11	kit	22780

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

Note: Merlin Microseal septa require a 23-gauge (0.63 mm, 0.025") needle or probe with a blunt, truncated conical tip. Compatible syringes and replacement needles are available at www.restek.com.

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
	Screw-Thread	18-425	Red PTFE/Silicone, 1.9 mm thick	100-pk.	23092
Magnetic Caps and Septa	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).



Our product line is continually expanding!
 Find rugged SPME Arrows and see
 what's new at www.restek.com/SPME

RESTEK
 Pure Chromatography

Questions? Contact us or your local Restek representative (www.restek.com/contact-us).

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