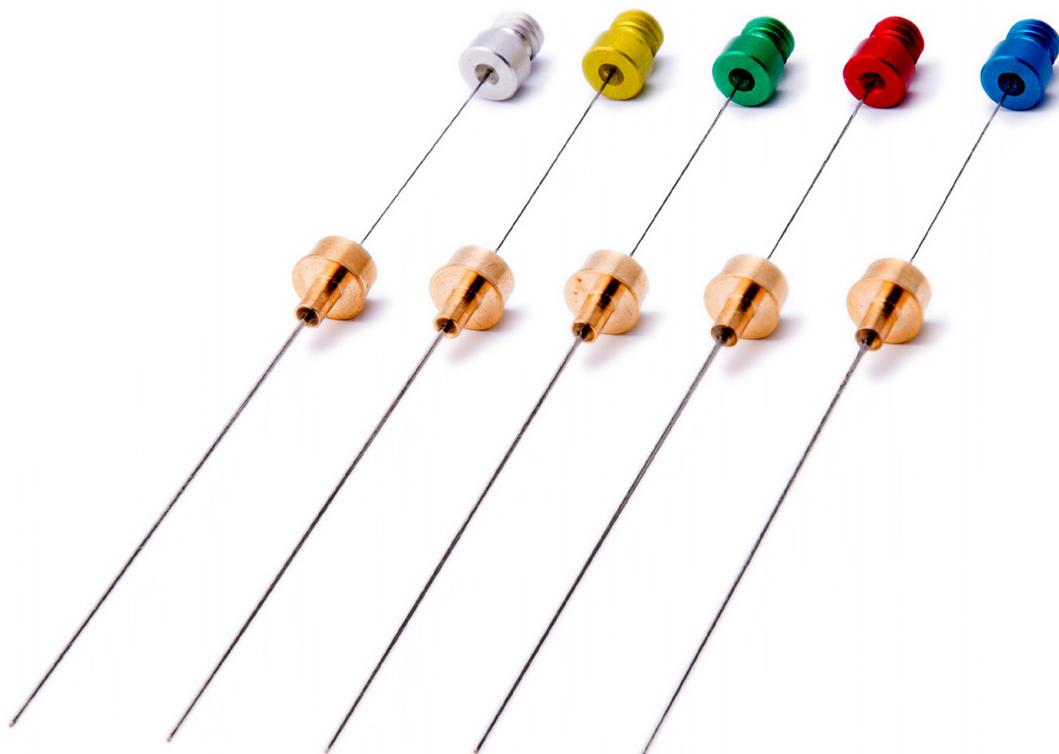


High-Performing Restek PAL SPME Fibers

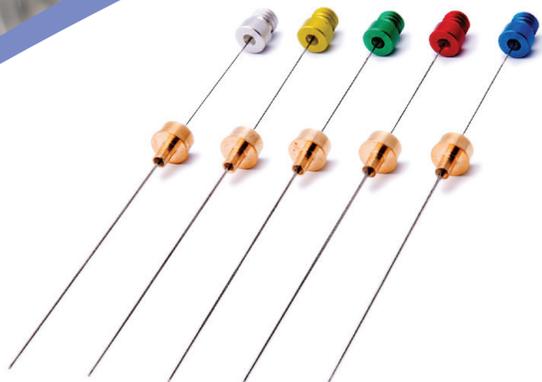
- Suitable for a wide range of analyte chemistries and sample matrices.
- Reliable performance meets or exceeds other brands.
- Robust aluminum hub is more durable than plastic.
- Optimized for PAL system autosamplers and compatible with most GC inlets.





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:

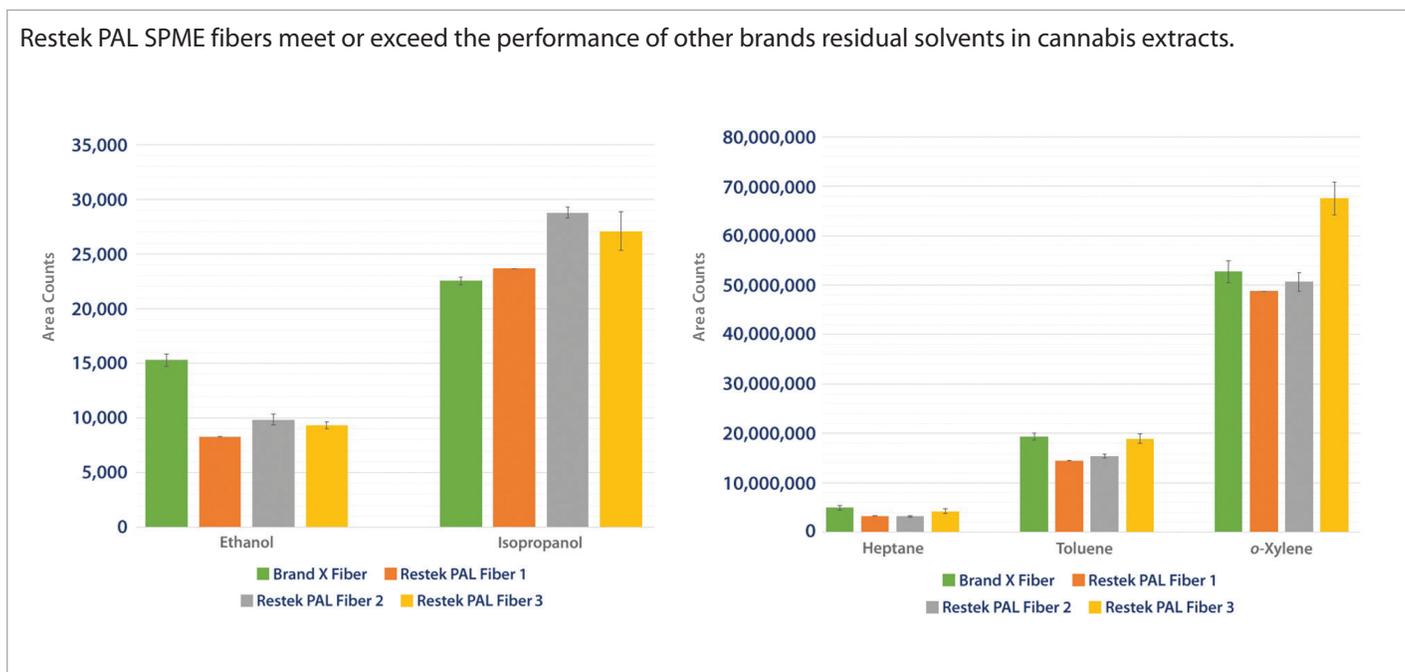
- 3 g sodium chloride (NaCl) was measured into a 20 mL amber headspace vial (cat. # 23086) with screw top cap (cat. # 23090).
- 6 mL of deionized (DI) water was then added to the vial.
- Residual solvents (cat.# 34105) standard and *n*-propane, isobutane, *n*-butane (Emerald Scientific) standards were spiked at 10 $\mu\text{g}/\text{mL}$.
- 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 $^{\circ}\text{C}$ with 1,000 rpm agitation
- Thermal Desorption: 10 sec at 250 $^{\circ}\text{C}$
- Column: Rxi-624 Sil MS, 30 m x 0.25 mm x 1.40 μm (cat. # 13868)
- Oven Program: 30 $^{\circ}\text{C}$ (hold 3 min) to 85 $^{\circ}\text{C}$ (hold 2 min) at 15 $^{\circ}\text{C}/\text{min}$ to 250 $^{\circ}\text{C}$ at 35 $^{\circ}\text{C}/\text{min}$
- 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*	Max. Temp.	Recommended Operating Temp.	Restek Hub Color	Similar to Sigma Aldrich Hub Color	ea. cat.#	3-pk. cat.#	5-pk. cat.#
Polydimethylsiloxane (PDMS) Fiber, Nonpolar							
7 µm	340 °C	200–340 °C	Green	Green	27482.1	27482.3	27482.5
30 µm	280 °C	200–280 °C	Golden	Yellow	27481.1	27481.3	27481.5
100 µm	280 °C	200–280 °C	Red	Red	27480.1	27480.3	27480.5
Polyacrylate (PA) Fiber, Polar							
85 µm	280 °C	200–280 °C	Gray	White	27478.1	27478.3	27478.5
Carbon Wide Range (WR)/PDMS Fiber							
95 µm	300 °C	220–300 °C	Dark Blue	Black	27479.1	27479.3	27479.5
Divinylbenzene (DVB)/PDMS Fiber							
65 µm	300 °C	220–300 °C	Violet	Blue	27874.1	27874.3	27874.5
DVB/Carbon WR/PDMS Fiber							
80 µm (50 DVB / 30 Carbon WR)	300 °C	220–300 °C	Dark Gray	Gray	27873.1	27873.3	27873.5
Description						cat.#	
Method Development SPME Fiber Kit						27483	
Includes one SPME fiber each: PDMS 7 µm, PDMS 30 µm, PDMS 100 µm, PA 85 µm, Carbon WR/PDMS 95 µm							

*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 and traditional SPME fibers during extraction and injection steps.

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



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)

1 µg/mL in water:methanol (99:1), 1 mL/ampul

cat.# 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

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.	cat.#
Straight/SPME, Premium Deactivation, Borosilicate Glass		
1.8 mm x 6.5 mm x 78.5 mm	5-pk.	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

* 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





22781



22972



22642



22814



22779

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.

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	Merlin#	Similar to PE#	qty.	cat.#
General-Purpose Kit (3 to 100 psi) for PerkinElmer GCs Includes: nut (1); adaptor (1); O-ring; general-purpose (#410) Microseals (2)	51-12	N9303344	kit	22781

Merlin Microseal Septa

for Shimadzu GCs

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

Merlin Microseal Septa

for Thermo TRACE 1300 and 1310 GCs

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

Merlin Microseal Septa for Agilent GCs

Description	Merlin #	Similar to Agilent Part #	qty.	cat.#
General-Purpose Kit (3 to 100 psi) for Agilent GCs				
Includes: nut (1); general-purpose (#410) Microseals (2)	404	5181-8833	kit	22810
Includes: nut (1); general-purpose (#410) Microseal (1)	405	5182-3442	kit	22811
Low-Pressure Kit (1 to 45 psi) for Agilent GCs				
Includes: nut (1); low-pressure (#310) Microseals (2)	304		kit	22813
Includes: nut (1); low-pressure (#310) Microseal (1)	305	5181-8816	kit	22814
Replacement Microseal Nut	403	5182-3445	ea.	22809

Merlin Microseal Septa for Bruker/Varian GCs

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

Replacement Microseals for Merlin Microseal Septa

Replacement Microseals	Merlin#	qty.	cat.#
Microseal for Traditional SPME Fiber Applications (3 to 100 psi)	21-01	ea.	22782



22782

SPME Vials, Caps, and Septa

Magnetic Screw-Thread Caps, 18 mm

Description	Septa Material	100-pk.	1,000-pk.
Magnetic Caps and Septa for SPME	Blue PTFE/Silicone, 1.5 mm thick	23090	23091
Magnetic Caps and Septa	Red PTFE/Silicone, 1.9 mm thick	23092	23093
Magnetic Caps and Septa	PTFE/Red Chlorobutyl	23094	23095



SPME MicroCenter Caps and Septa

Description	Type	Color	Septa Material	100-pk.	1,000-pk.
SPME Vial Cap, 18 mm	Screw-Thread		MicroCenter PTFE/Silicone	23852	23853
SPME Vial Cap, 20 mm	Bi-Metal Crimp	Blue	MicroCenter PTFE/Silicone	23854	23855
SPME Vial Cap, 20 mm	Bi-Metal Crimp	Red	MicroCenter PTFE/Silicone	23856	23857
SPME Vial Cap, 20 mm	Steel Crimp	Gold	MicroCenter PTFE/Silicone	23858	23859
SPME Vial Septa, 18 mm			MicroCenter PTFE/Silicone	23850	23851



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

Headspace Crimp Vials, 20 mm

Description	Volume	Color	Dimensions	100-pk.	1,000-pk.
Headspace Vial	6 mL	Clear	22 x 38 mm	21166	21167
Headspace Vial, Flat Bottom	10 mL	Clear	23 x 46 mm	24683	24684
Headspace Vial, Rounded Bottom	10 mL	Clear	23 x 46 mm	21164	21165
Headspace Vial, Flat Bottom	20 mL	Clear	23 x 75 mm	24685	24686
Headspace Vial, Rounded Bottom	20 mL	Clear	23 x 75 mm	21162	21163
Headspace Vial	27 mL	Clear	30 x 60 mm	21160	21161



6.0 mL Headspace Vial

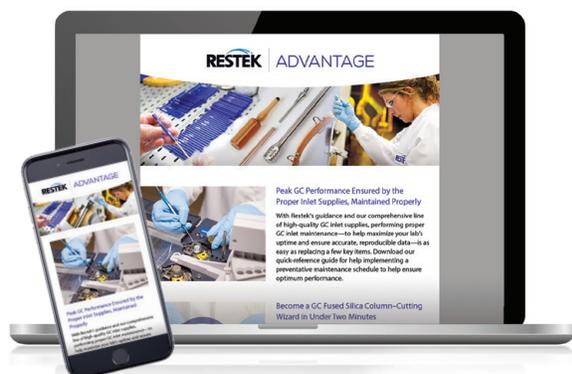
Headspace Screw-Thread Vials, 18 mm

Description	Volume	Color	Dimensions	100-pk.	1,000-pk.
Headspace Vial	10 mL	Clear	22 x 45 mm	23084	23085
Headspace Vial	10 mL	Amber	22 x 45 mm	23088	23089
Headspace Vial	20 mL	Clear	22 x 75 mm	23082	23083
Headspace Vial	20 mL	Amber	22 x 75 mm	23086	23087



THE RESTEK ADVANTAGE

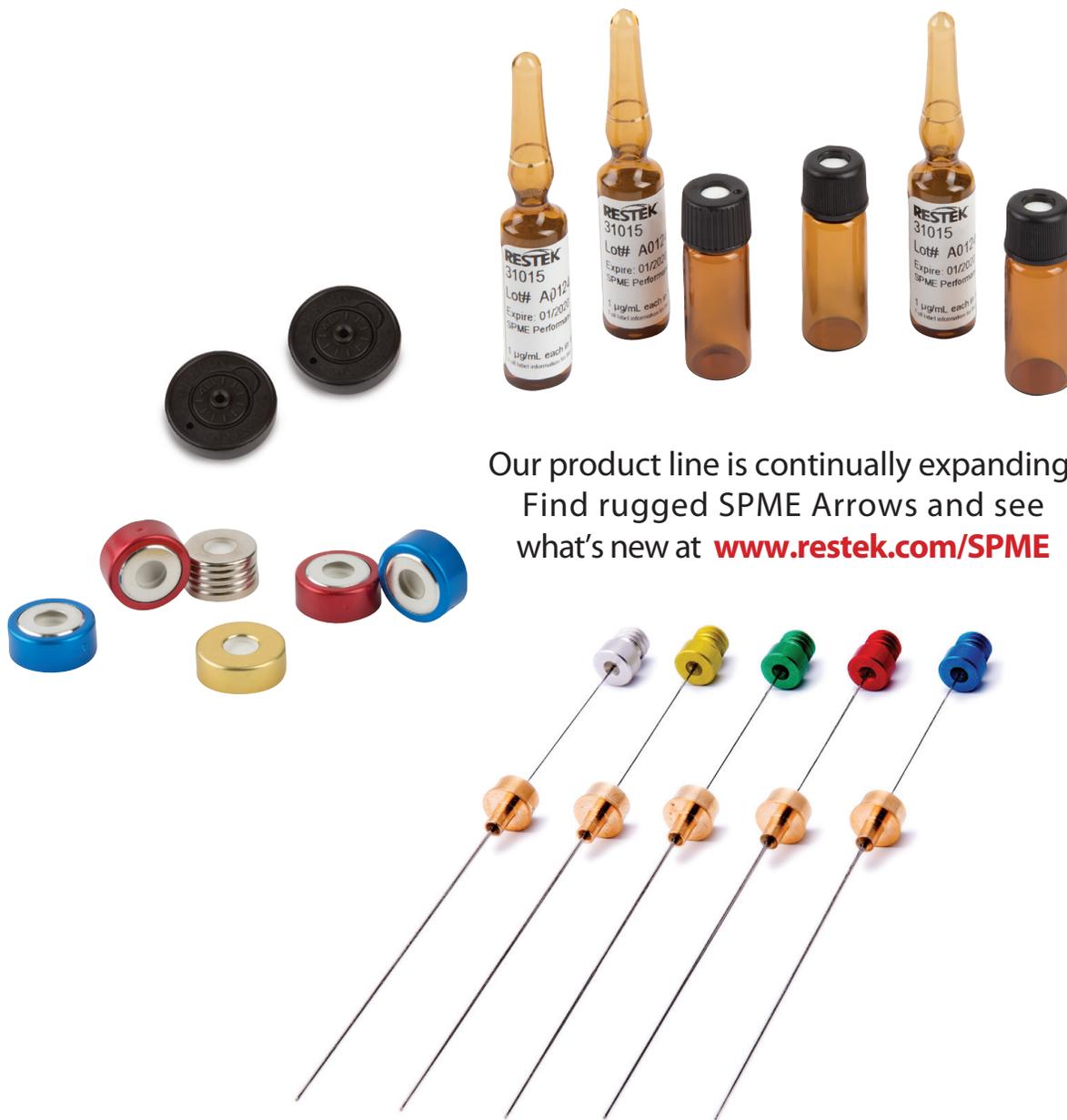
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Our product line is continually expanding!
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 what's new at www.restek.com/SPME

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