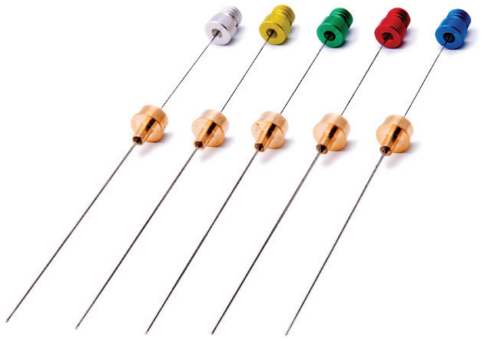
Restek® PAL SPME Fibers

cat.# 27478–27483

Solid phase microextraction (SPME) fibers are used to extract organic compounds from solid, liquid, and vapor matrices onto a stationary phase that is bonded to a fused silica fiber. Typically, the analytes are then thermally desorbed in the inlet of a gas chromatograph (GC). Prior to using this product, SPME end users should read this instruction sheet and become familiar with SPME fiber selection and proper conditioning procedures.



SPME Fiber Selection

Restek® PAL SPME fibers are available with different stationary phases and film thicknesses to support a wide range of analyte chemistries and sample matrices. Choose the best SPME fiber for your application based on the properties of the compounds to be analyzed. Use Table I to select the proper fiber type. Fiber types can be identified by the color of the hub, as shown in Figure 1 and Table II.

Table I: Select the correct SPME fiber based on the properties of the target analytes. See Table II for hub colors and part numbers.

Target Analytes	Molecular Weight*	Stationary Phase	Thickness (µm)
Nonpolar	125–600	Polydimethylsiloxane (PDMS)	7
Nonpolar, semivolatile	80–500	Polydimethylsiloxane (PDMS)	30
Volatile	60–275	Polydimethylsiloxane (PDMS)	100
Polar, semivolatile	80–300	Polyacrylate	85
Highly volatile	30–225	Carbon WR/PDMS	95

*These molecular weight ranges are a reasonable approximation; however, end users should verify suitability for their specific application.

Figure 1: SPME fiber identification can be confirmed by the color of the hub.

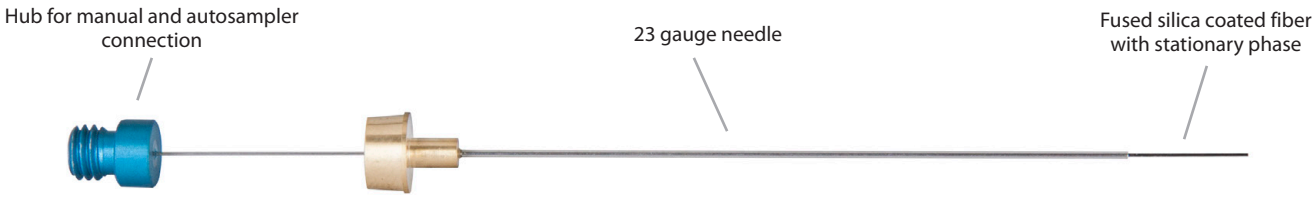


Table II: SPME Fiber Hub Color and Part Number Reference

Stationary Phase Description*	Thickness (µm)	Restek Hub Color	Similar to Supelco Hub Color	Each (cat.#)	3-pk. (cat.#)	5-pk. (cat.#)
Polydimethylsiloxane (PDMS)	7	Green	Green	27482.1	27482.3	27482.5
Polydimethylsiloxane (PDMS)	30	Golden	Yellow	27481.1	27481.3	27481.5
Polydimethylsiloxane (PDMS)	100	Red	Red	27480.1	27480.3	27480.5
Polyacrylate	85	Grey	White	27478.1	27478.3	27478.5
Carbon Wide Range (WR)/PDMS	95	Dark Blue	Black	27479.1	27479.3	27479.5
Method Development Fiber Kit (Set of 5 includes one fiber of each type listed above.)	See above	See above	See above	–	–	27483

*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.

SPME Fiber Thermal Conditioning and Solvent Cleaning

General Precautions

- Never touch the stationary phase of a SPME fiber, not even when wearing gloves.
- Never expose a fiber to heat without an inert gas present to protect the stationary phase.
- Never exceed the maximum recommended temperature of the fiber.
- Never soak a fiber in chlorinated solvents.
- Note that sampling technique may affect fiber lifetime (i.e., number of viable analyses). Immersion sampling in liquids containing complex matrices may reduce fiber lifetime. In contrast, headspace sampling generally results in longer fiber lifetimes.
- It is not possible to judge fiber quality visually, except for obvious major mechanical damage.
- Staining, which can be caused by the beginning of vitrification on the surface of a PDMS fiber or appear as a yellowish discoloration in the case of a polyacrylate fiber, does not give any indication of the remaining life span of the fiber.

Thermal Conditioning

Prior to their first use, new SPME fibers need an initial preconditioning at a specified temperature and duration (Table III) in an inert gas environment. In addition, all fibers should undergo conditioning at the beginning of the work day and between samples to prevent carryover. The life span of a fiber can be extended if the fiber is not unnecessarily exposed to its maximum temperature. In general, fibers should be conditioned at 20 °C above the planned operating temperature, without exceeding the fiber's maximum temperature threshold.

Fibers may be conditioned in the inlet of a GC. However, to avoid contaminating the GC system, conditioning the fiber in a separate SPME fiber conditioning module is recommended. When conditioning fibers in a GC inlet, always use an appropriate liner (0.75–1.0 mm ID). Never use an inlet liner with glass wool; if the fiber contacts wool, the stationary phase may be damaged. When conditioning fibers in a GC inlet, be sure to use a high split (e.g., 40 or higher) to reduce the amount of contaminants entering the GC column.

Solvent Cleaning

If thermal conditioning was inadequate and/or particulates are present on the SPME fiber, solvents may be used to clean the fiber. All SPME fibers have bonded stationary phases, which may swell when exposed to certain solvents (particularly chlorinated solvents). If a swollen fiber is retracted into the needle, the needle may damage the stationary phase. Swelling may occur in both headspace and immersion modes; therefore, it is important to only use solvents that are compatible with each stationary phase (Table III). Never clean a SPME fiber by mechanical means.

Table III: SPME Fiber Thermal Conditioning and Solvent Cleaning Parameters

Stationary Phase, Thickness (µm)	Max Temp (°C)	Recommended Operating Temp (°C)	Conditioning Temp (°C) Min / Max	Preconditioning Time (min) Min / Max	Conditioning Time (min) Min / Max	Cleaning Solvent*	Cleaning Time (min) Min / Max
PDMS, 7	340	200–340	200 / 340	15 / 120 (30 is recommended)	1 / 60 (5 is recommended)	MeOH / EtOH / IPA	0.5 / 10 (2 is recommended)
PDMS, 30	280	200–280	180 / 280	15 / 120 (30 is recommended)	1 / 60 (5 is recommended)	MeOH / EtOH / IPA	0.5 / 10 (2 is recommended)
PDMS, 100	280	200–280	180 / 280	15 / 120 (30 is recommended)	1 / 60 (5 is recommended)	MeOH / EtOH / IPA	0.5 / 10 (2 is recommended)
Polyacrylate, 85	280	200–280	180 / 280	15 / 120 (30 is recommended)	1 / 60 (5 is recommended)	MeOH / aliphatic HC	0.5 / 10 (2 is recommended)
Carbon WR/PDMS, 95	300	220–300	200 / 300	15 / 120 (60 is recommended)	1 / 60 (10 is recommended)	MeOH / EtOH / IPA	0.5 / 10 (2 is recommended)

*Cleaning solvents for a given fiber type may be used alone or mixed together. MeOH = methanol, EtOH = ethanol, IPA = isopropyl alcohol, aliphatic HC = hexane (or similar)

Refer to the equipment owner's manual for proper installation and operation of the SPME fiber within an autosampler or manual fiber holder.

Questions about this or any other Restek® product?
Contact us or your local Restek® representative (www.restek.com/contact-us).

www.restek.com
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RESTEK

Pure Chromatography
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Restek PAL SPME Fibers

Cat.# 27483

1 2

- 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.
- SPME automated sample preparation reduces sample handling and solvent consumption.

Instruction Sheets

Restek PAL SPME Fibers Instruction Sheet

Select a Product

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Catalog #	Product Name	Material	Color	Thickness	Max Temp.	Recommended Operating Temp.	Units	
27482.1	SPME Fiber	Polydimethylsiloxane (PDMS) Fiber, Nonpolar	Green	7 µm	340 °C	200–340 °C	ea.	Select
27482.3	SPME Fiber	Polydimethylsiloxane (PDMS) Fiber, Nonpolar	Green	7 µm	340 °C	200–340 °C	3-pk.	Select
27482.5	SPME Fiber	Polydimethylsiloxane (PDMS) Fiber, Nonpolar	Green	7 µm	340 °C	200–340 °C	5-pk.	Select
27481.1	SPME Fiber	Polydimethylsiloxane (PDMS) Fiber, Nonpolar	Golden	30 µm	280 °C	200–280 °C	ea.	Select
27481.3	SPME Fiber	Polydimethylsiloxane (PDMS) Fiber, Nonpolar	Golden	30 µm	280 °C	200–280 °C	3-pk.	Select
27481.5	SPME Fiber	Polydimethylsiloxane (PDMS) Fiber, Nonpolar	Golden	30 µm	280 °C	200–280 °C	5-pk.	Select
27480.1	SPME Fiber	Polydimethylsiloxane (PDMS) Fiber, Nonpolar	Red	100 µm	280 °C	200–280 °C	ea.	Select
27480.3	SPME Fiber	Polydimethylsiloxane (PDMS) Fiber, Nonpolar	Red	100 µm	280 °C	200–280 °C	3-pk.	Select
27480.5	SPME Fiber	Polydimethylsiloxane (PDMS) Fiber, Nonpolar	Red	100 µm	280 °C	200–280 °C	5-pk.	Select
27478.1	SPME Fiber	Polyacrylate (PA) Fiber, Polar	Gray	85 µm	280 °C	200–280 °C	ea.	Select
27478.3	SPME Fiber	Polyacrylate (PA) Fiber, Polar	Gray	85 µm	280 °C	200–280 °C	3-pk.	Select
27478.5	SPME Fiber	Polyacrylate (PA) Fiber, Polar	Gray	85 µm	280 °C	200–280 °C	5-pk.	Select
Quick Filters [Clear All]	all	all	all	all	all	all	all	

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Description

- 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.
- SPME automated sample preparation reduces sample handling and solvent consumption.

Solid phase microextraction (SPME) is an automated sample preparation technique that reduces sample handling and solvent consumption. SPME technology has many applications in environmental, food, clinical, and other industries. Restek PAL SPME fibers are high-performing fibers that meet or exceed the performance of other brands. Our reliable SPME fibers are optimized for PAL system autosamplers and are compatible with most GC inlets. Restek SPME fibers are suitable for a wide range of analyte chemistries and sample matrices.

Our SPME product line is continually expanding and our current products and recommended uses include the following.

- 7 µm PDMS fibers are recommended for nonpolar, high molecular weight analytes (125–600 Da).
- 30 µm PDMS fibers are recommended for nonpolar, semivolatile analytes (80–500 Da).
- 100 µm PDMS fibers are recommended for volatile analytes (60–275 Da).
- 85 µm Polyacrylate fibers are recommended for polar, semivolatile analytes (80–300 Da).
- 95 µm Carbon Wide Range (WR)/PDMS fibers are recommended for gases and highly volatile low molecular weight analytes (30–225).

*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

Pure Chromatography
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SPME MicroCenter Caps and Septa

1 2

- Micro-thin septum center pierces easily without bending needles or breaking SPME fibers.
- Thicker outer septum wall secures septum in place and ensures a tight seal.
- Versatile closures are suitable for SPME as well as dynamic and static headspace applications.
- Septa are manufactured from low-extractability silicone and molded for dimensional conformity.
- Available in 18 mm screw caps and 20 mm crimp caps.

Select a Product

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

Showing 1 to 10 of 10

Description

- Micro-thin septum center pierces easily without bending needles or breaking SPME fibers.
- Thicker outer septum wall secures septum in place and ensures a tight seal.
- Versatile closures are suitable for SPME as well as dynamic and static headspace applications.
- Septa are manufactured from low-extractability silicone and molded for dimensional conformity.
- Available in 18 mm screw caps and 20 mm crimp caps.

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