



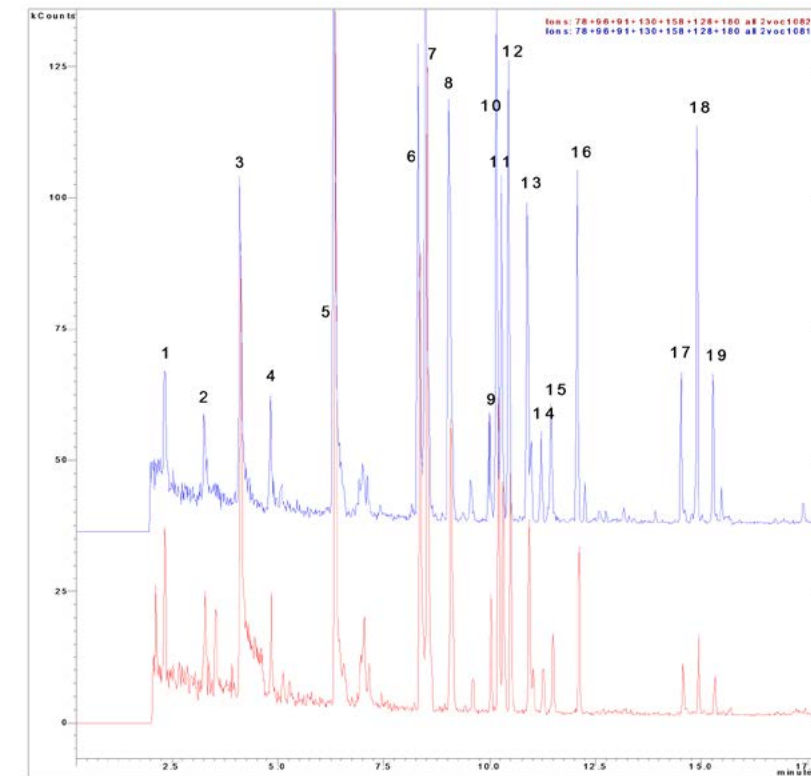
PAL SPME Fibers for PAL COMBI





Comparison of PAL SPME Fibers with established Fibers

The PAL SPME Fibers (PDMS fibers 7 μm , 30 μm , and 100 μm and the polyacrylate fiber) yield identical results when compared with the corresponding commercial fibers. For medium and high boiling compounds the PAL SPME Carbon WR Fiber in certain cases shows an even better performance than the established fibers.



- 1 1,1-Dichloroethene
- 2 cis-1,2-Dichloroethene
- 3 Benzene
- 4 Trichloroethylene
- 5 Toluene
- 6 Ethylbenzene
- 7 m-,p- Xylene
- 8 o-Xylene
- 9 Bromobenzene
- 10 2-Chlorotoluene
- 11 1,3,5-Trimethylbenzene
- 12 4 Chlorotoluene
- 13 tert-Butylbenzene
- 14 1,2,4-Trimethylbenzene
- 15 sec-Butylbenzene
- 16 n-Butylbenzene
- 17 1,2,4-Trichlorobenzene
- 18 Naphthalene
- 19 1,2,3-Trichlorobenzene

Fig. 1: Comparison of fibers for the analysis of VOCs: PAL SPME Carbon WR Fiber 95 μm (blue) and Brand X Carboxen[®] fiber (red).

PAL SPME Fiber

Since its introduction by Pawliszyn et al. (ref. 1) Solid Phase Micro Extraction (SPME) has seen a tremendous development. SPME is a very effective way of automated sample preparation.

It is used for extracting organics from a matrix (solid, liquid or gaseous) into a stationary phase immobilized on a fiber. The analytes are thermally desorbed directly in the injector of a gas chromatograph. Originally mostly used for extracting solvents with excellent sensitivities from aqueous matrices the range of applications today spans from chemical and environmental to medical applications.

PAL SPME Fibers have been developed and optimized for the most successful SPME sampler, the PAL COMBI. The fibers are offered with different coatings and film thicknesses. Their excellent extraction properties have been proven for many important applications.

Reference ⁽¹⁾

Detection of substituted benzenes in water at the pg/ml level using solid-phase microextraction and gas chromatography-ion trap mass spectrometry.

Potter DW, Pawliszyn J., J Chromatogr. 1992 Nov 20;625(2):247-55.

Choose the right Fiber for your Analytes

Typical applications for the SPME technique are:

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

The type of the fiber corresponds to the polarity and the molecular weight of the analytes:

- For nonpolar samples a PDMS coated fiber should be chosen.
- For low molecular weights or volatile compounds a 100 μm PDMS-coated fiber is usually the best choice.

- Larger molecular weights or semi-volatile compounds are more effectively extracted using a 30 μm , or 7 μm PDMS-coated fiber.
- For an effective extraction of analytes with a very high polarity from polar samples, the 85 μm polyacrylate-coated fiber is the best alternative.
- For trace-level volatiles analysis, use the 95 μm Carbon WR (Carbon Wide Range / PDMS) coated fiber.

Note: The 100 μm and 30 μm PDMS-coated fibers cannot be used with hexane.

A SPME adapter together with a corresponding holder for the SPME Fibers is available for the PAL and PAL-xt System models dedicated for SPME technique such as Combi PAL or PAL COMBI-xt. The main features of the SPME Option are:

- Easy fiber exchange by hand
- Maximum fiber protection
- Compatible with a variety of different SPME fibers 10 mm or 20 mm fiber length supported.

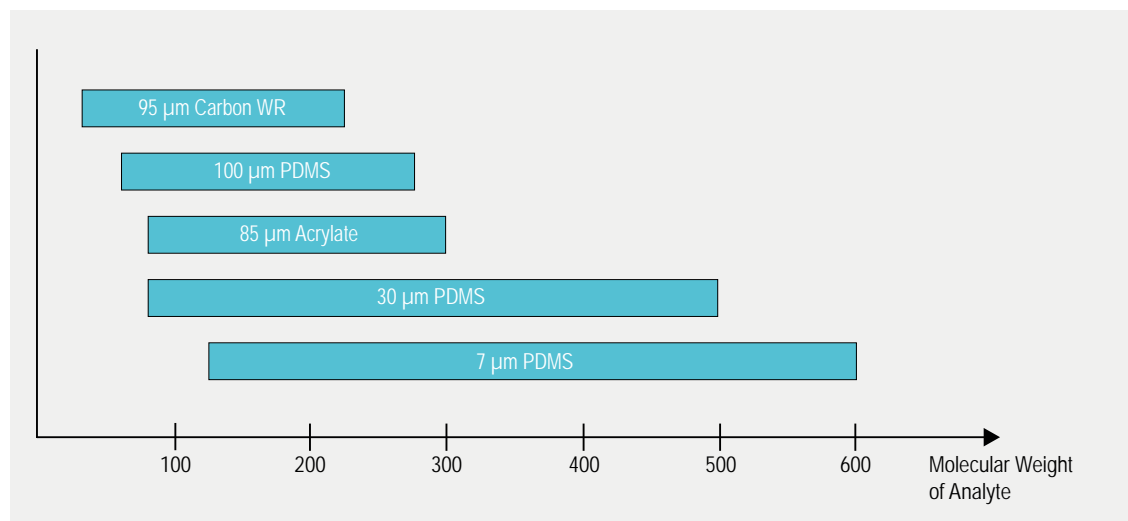


Fig. 2: Correlation between molecular weight of the analyte and the fiber type

Type of Analyte	Molecular Weight	Recommended Fiber
Non-polar high molecular weight compounds	125 - 600	7 μm PDMS (Polydimethylsiloxane)
Non-polar semi-volatiles	80 - 500	30 μm PDMS (Polydimethylsiloxane)
Polar semi-volatiles	80 - 300	85 μm Polyacrylate (Polyacrylate)
Volatiles	60 - 275	100 μm PDMS (Polydimethylsiloxane)
Gases and low molecular weight compounds	30 - 225	95 μm Carbon WR / PDMS (Carbon Wide Range / Polydimethylsiloxane)

Table 2: Which fiber for which type of analyte?

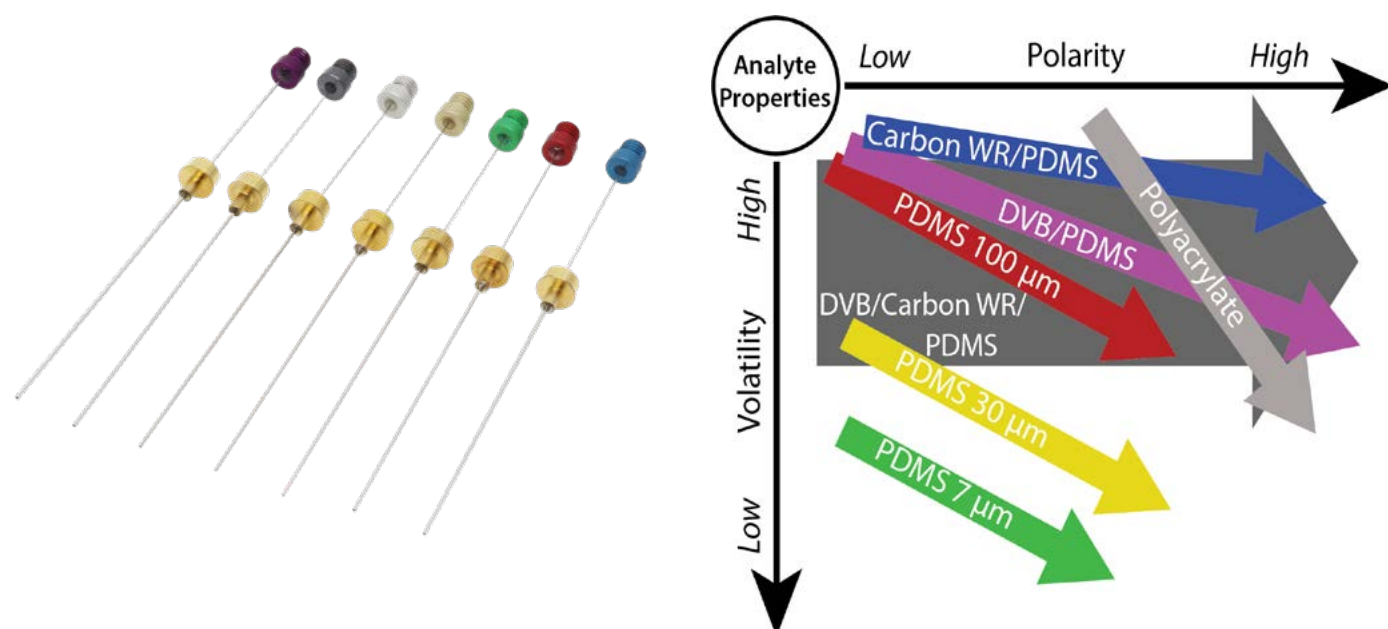


Fig. 3: Color Code for easy optical identification of coating type and thickness

PAL SPME Fiber Ordering Information

The PAL SPME Fibers are available in order quantities of one, three or five fibers per box. For method development, a set of each fiber type (set of five) is available.

No.	Phase Thickness	Color Code	Set of 1 Fiber PNo.	Set of 3 Fibers PNo.	Set of 5 Fibers PNo.
PDMS SPME Fiber (Polydimethylsiloxane)					
1	7 μm	Green	FIB-P-7/10-P1	FIB-P-7/10-P3	FIB-P-7/10-P5
2	30 μm	Golden	FIB-P-30/10-P1	FIB-P-30/10-P3	FIB-P-30/10-P5
3	100 μm	Red	FIB-P-100/10-P1	FIB-P-100/10-P3	FIB-P-100/10-P5
Polyacrylate SPME Fiber					
4	85 μm	Grey	FIB-A-85/10-P1	FIB-A-85/10-P3	FIB-A-85/10-P5
Carbon WR / PDMS SPME Fiber (Carbon Wide Range / Polydimethylsiloxane)					
5	95 μm	Dark Blue	FIB-C-WR-95/10-P1	FIB-C-WR-95/10-P3	FIB-C-WR-95/10-P5
DVB / PDMS SPME Fiber (Divinylbenzene / Polydimethylsiloxane)					
6	65 μm	Violet	FIB-DVB-65/10-P1	FIB-DVB-65/10-P3	FIB-DVB-65/10-P5
DVB / PDMS/ Carbon WR SPME Fiber (Divinylbenzene / Polydimethylsiloxane / Carbon Wide Range) Dual phase					
7	80 μm (50 μm / 30 μm)	Dark grey	FIB-DVB/C-WR-80/10-P1	FIB-DVB/C-WR-80/10-P3	FIB-DVB/C-WR-80/10-P5
Fiber Selection for method development (set of 5 different SPME Fiber types)					
Fiber Selection of SPME Fiber No. 1, 2, 3, 4 and 5					FIB-SEL5-S1

Table 1: PAL SPME Fiber Order Information.

All PAL SPME Fibers have a standard length of 10 mm and the core material is Fused Silica.

PAL SPME Fibers can be used for a wide range of GC and injector model.



Find more information about [SPME Fibers](#)

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