Capillary Column — Wax at 300°C
**WHY use SolGel-WAX™?**

Several large trans national companies have adopted SolGel-WAX after extensive testing. Feedback has been:

“It is the most stable of polyethylene glycol phases we have ever used”

“I have injected water samples many thousands of times in the phase and retention time reproducibility is excellent. Times have not varied by more than 0.02 minutes for target compounds”

“If you want the most robust, hassle-free Wax Column on the market, use SolGel-WAX.

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**WHAT is SolGel-WAX?**

SolGel-WAX is a bonded polyethylene glycol stationary phase. It is unique technology because the phase is encapsulated in synthetic glass (SolGel material) and the whole matrix is itself bonded to the surface of the fused silica. This process leads to a very inert high-temperature column. The SolGel-WAX column is represented schematically in Figure 1. A conventional Wax column is coated onto the surface of the fused silica but does not contain the glass element which gives the column extra robustness and thermal stability.

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**Figure 1. Schematic representation of SolGel-WAX.**

1a. SolGel-WAX phase anchored to the surface of the fused silica.

1b. Conventional 100% methyl column with the phase coated onto the surface of the fused silica — no anchoring.

SolGel-WAX is the highest temperature polyethylene glycol column on the market.
**Analysis of Ylang Ylang essential oil on SolGEL-WAX**

- **Phase:** SolGEL-WAX, 0.25µm film
- **Sample:** Ylang Ylang oil, neat
- **Column:** 30m x 0.25mm ID
- **Initial Temp:** 40°C, 2min
- **Rate 1:** 3°C/min to 250°C
- **Final Temp:** 250°C, 10min
- **Detector Type:** MSD
- **Carrier Gas:** He, 25.7psi
- **Carrier Gas Flow:** 1.8mL/min
- **Constant Flow:** On
- **Linear Velocity:** 35cm/sec at 40°C
- **Injection Mode:** Split

**COMPONENTS:**
1. β-Methyl anisole
2. α-Copaene
3. Linalool
4. β-Caryophyllene
5. Methyl benzoate
6. α-Humulene
7. α-Amorphene
8. Germacrene
9. Benzyl acetate
10. δ-Cadinene

**Analysis of industrial solvents on SolGEL-WAX**

- **Phase:** SolGEL-WAX, 0.5µm film
- **Sample:** Industrial solvents mix, 25 to 50ng per component on column
- **Column:** 30m x 0.32mm ID
- **Initial Temp:** 35°C, 3min
- **Rate 1:** 15°C/min
- **Final Temp:** 230°C
- **Detector Type:** FID at 270°C
- **Carrier Gas:** He, 8.4psi
- **Carrier Gas Flow:** 1.84mL/min

**COMPONENTS:**
1. Acetone
2. Ethyl acetate
3. Methyl ethyl ketone
4. Contaminant
5. iso-Propanol
6. Ethanol
7. Methyl isobutyl ketone
8. Toluene
9. Butyl acetate
10. iso-Butanol
11. Propylene glycol monomethyl ether
12. n-Butanol
13. Ethyl benzene
14. p-Xylene
15. m-Xylene
16. α-Xylene
17. Butyl Cellosolve acetate
18. Cyclohexanone
19. Butyl Cellosolve
20. Butyl glycol acetate
21. Hexyl Cellosolve
22. Isophorone
23. Butyl Carbitol
24. Benzyl alcohol
25. Benzyl alcohol
**Analysis of BTEX on SolGel-WAX**

<table>
<thead>
<tr>
<th>Phase:</th>
<th>SolGel-WAX, 0.25µm film</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTEX:</td>
<td>300ppm in methanol</td>
</tr>
<tr>
<td>Column:</td>
<td>30m x 0.25mm ID</td>
</tr>
<tr>
<td>Initial Temp:</td>
<td>60°C, 10min</td>
</tr>
<tr>
<td>Detector Type:</td>
<td>FID</td>
</tr>
<tr>
<td>Carrier Gas:</td>
<td>He, 17.3psi</td>
</tr>
<tr>
<td>Carrier Gas Flow:</td>
<td>1.5mL/min</td>
</tr>
<tr>
<td>Constant Flow:</td>
<td>On</td>
</tr>
<tr>
<td>Linear Velocity:</td>
<td>35cm/sec at 60°C</td>
</tr>
</tbody>
</table>

**Injection Mode:** Split  
**Split Ratio:** 100:1  
**Injection Volume:** 0.2µL  
**Injection Temp:** 250°C  
**Autosampler:** No  
**Liner Type:** 4mm ID double taper liner  
**Liner Part No:** 092018  
**Column Part No:** 054796

**COMPONENTS:**
1. Benzene  
2. Toluene  
3. Ethyl benzene  
4. p-Xylene  
5. m-Xylene  
6. o-Xylene

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**Analysis of FAME on SolGel-WAX**

<table>
<thead>
<tr>
<th>Phase:</th>
<th>SolGel-WAX, 0.25µm film</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample:</td>
<td>200ppm in dichloromethane</td>
</tr>
<tr>
<td>Column:</td>
<td>30m x 0.25mm ID</td>
</tr>
<tr>
<td>Initial Temp:</td>
<td>155°C</td>
</tr>
<tr>
<td>Rate 1:</td>
<td>2°C/min to 180°C</td>
</tr>
<tr>
<td>Rate 2:</td>
<td>4°C/min to 220°C</td>
</tr>
<tr>
<td>Final Temp:</td>
<td>220°C, 5min</td>
</tr>
<tr>
<td>Detector Type:</td>
<td>MSD</td>
</tr>
<tr>
<td>Carrier Gas:</td>
<td>He, 35.3psi</td>
</tr>
<tr>
<td>Carrier Gas Flow:</td>
<td>1.6mL/min</td>
</tr>
<tr>
<td>Constant Flow:</td>
<td>On</td>
</tr>
<tr>
<td>Linear Velocity:</td>
<td>35cm/sec at 155°C</td>
</tr>
</tbody>
</table>

**Injection Mode:** Split  
**Split Ratio:** 80:1  
**Injection Volume:** 0.5µL  
**Injection Temp:** 250°C  
**Autosampler:** No  
**Liner Type:** 4mm ID double taper liner  
**Liner Part No:** 092018  
**Column Part No:** 054796  
**ms-NoVent™ Part No:** 113400  
**HPS973 Restrictor:** 113409

**COMPONENTS:**
1. Methyl butyrate (C4:0)  
2. Methyl hexanoate (C6:0)  
3. Methyl octanoate (C8:0)  
4. Methyl decanoate (C10:0)  
5. Methyl undecanoate (C11:0)  
6. Methyl laurate (C12:0)  
7. Methyl tridecanoate (C13:3)  
8. Methyl myristate (C14:0)  
9. Methyl myristoleate (C14:1)  
10. Methyl pentadecanoate (C15:0)  
11. Methyl 10-entadecenoate (C15:1)  
12. Methyl palmitate (C16:0)  
13. Methyl palmitoleate (C16:1)  
14. Methyl heptadecanoate (C17:0)  
15. Methyl stearate (C18:0)  
16. Methyl olate (C18:1)  
17. Methyl elaidate (C18:1T)  
18. Methyl linoleate (C18:2)  
19. Methyl linolenate (C18:3)  
20. Methyl gamma linolenate (C18:3)  
21. Methyl arachidate (C20:0)  
22. Methyl 11-eicosenoate (C20:1)  
23. Methyl 11,14-eicosenoate (C20:2)  
24. Methyl behenate (C22:0)  
25. Methyl erucate (C22:1)  
26. Methyl 11-14-17 eicosatrienoate (C20:3)  
27. Methyl homogamma linolenate (C20:3)  
28. Methyl arachidonate (C20:4)  
29. Methyl nervonate (C24:1)  
30. Methyl docosadienoate (C22:2)  
31. Methyl docosahexaenoate (C22:6)
use a polyethylene glycol (WAX) phase?

The main mechanism of separation for WAX type columns is hydrogen bonding or dipole interactions. This is the ideal separation mechanism for a mixture of components containing alcohols, esters, aldehydes, ketones or aromatics. For example, for essential oil analysis, a polyethylene glycol phase is preferred because of this. A non-polar polysiloxane phase, on the other hand, will separate components based on boiling points.

Wax type phases are ideal for:
- Essential oils
- Unreacted latex monomers
- Food additives
- Industrial solvents
- Mixtures of aromatic hydrocarbons (e.g., BTEX)
- Fatty Acid Methyl Esters (FAMEs)
- Mixtures of alcohols, esters, aldehydes & ketones

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30m x 0.25mm x 0.25µm SOLGEL-WAX™</td>
<td>054796</td>
</tr>
<tr>
<td>30m x 0.32mm x 0.5µm SOLGEL-WAX™</td>
<td>054797</td>
</tr>
<tr>
<td>60m x 0.25mm x 0.25µm SOLGEL-WAX™</td>
<td>054791</td>
</tr>
<tr>
<td>60m x 0.32mm x 0.5µm SOLGEL-WAX™</td>
<td>054792</td>
</tr>
</tbody>
</table>

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