Restek GC

# ShinCarbon ST Micropacked GC Columns

## Above-Ambient Analyses of Permanent Gases and Light Hydrocarbons

- Separate permanent gases, including CO/$CO_2$, without cryogenic cooling.
- Rapid separations of permanent gas/light hydrocarbon mixtures.
- Excellent compatibility with most GC detectors—minimal bleed, minimal baseline rise.
- Preconditioned, less than 30 minutes to stabilize.

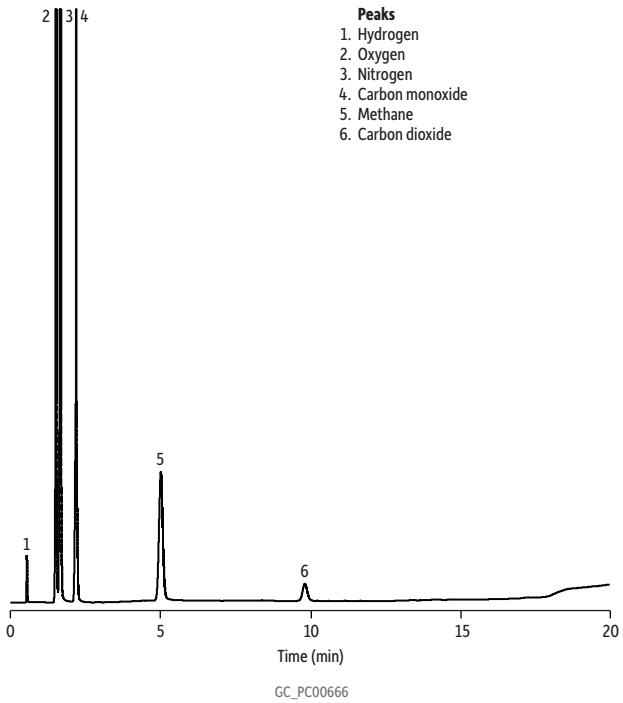
RESTEK Pure Chromatography www.restek.com

Analyzing the permanent gases oxygen, nitrogen, methane, carbon monoxide, and carbon dioxide has been virtually impossible for a single gas chromatography (GC) or gas-solid chromatography (GSC) column without sub-ambient temperatures.

Restek's ShinCarbon ST material, a high-surface-area carbon molecular sieve (~1500 $m^2/g$), is the ideal medium for separating gases and highly volatile compounds by GSC. A 2 m x 1 mm ID micropacked column containing ShinCarbon ST separates the permanent gases in 10 minutes without cryogenic cooling (Figure 1).

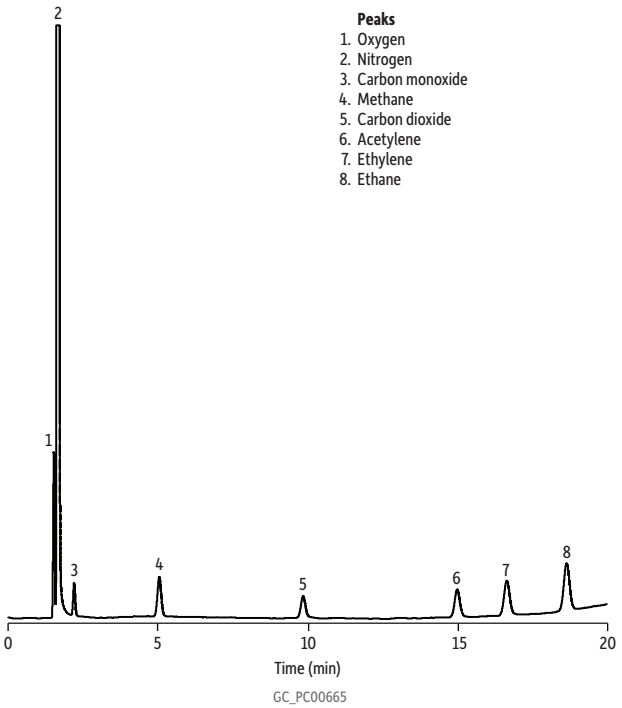
In addition to providing a breakthrough in analyses of permanent gases, ShinCarbon ST columns can separate light hydrocarbon/permanent gas mixtures. Figure 2 shows an analysis of permanent gases, plus acetylene, ethylene, and ethane, that was completed in less than 20 minutes. Natural gas components (70% methane) are also cleanly separated (Figure 3). Other potential applications for ShinCarbon ST include analyses of fluorocarbons (Figure 4).

**Figure 1:** Separate permanent gases in 10 minutes without cryogenic cooling.




| | |
|---|---|
| **Column** | 100/120 mesh, ShinCarbon ST, 2 m, 1/16 in. OD, 1.0 mm ID (cat.# 19808) |
| **Standard/Sample** | Permanent gases mix, approx. 5 mol % each |
| **Injection** | |
| Inj. Vol.: | 5 µL packed on-column |
| Inj. Temp.: | 100 °C |
| **Oven** | |
| Oven Temp.: | 40 °C (hold 3 min) to 250 °C at 8 °C/min (hold 10 min) |
| **Carrier Gas** | He, constant flow |
| Flow Rate: | 10 mL/min |
| **Detector** | HID @ 250 °C |

**Figure 2:** Rapidly analyze light hydrocarbon/permanent gas mixtures.

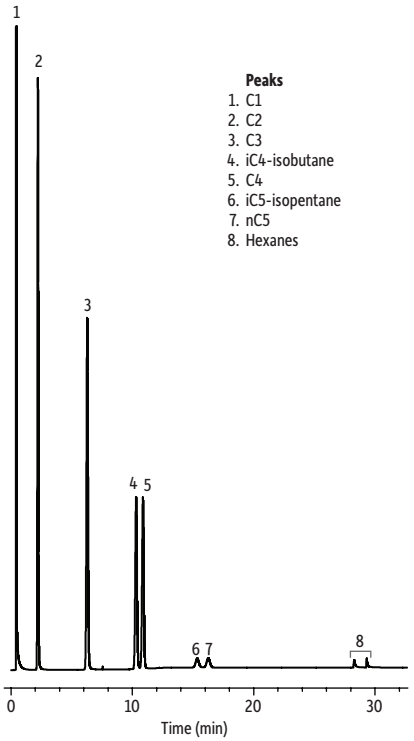



| | |
|---|---|
| **Column** | 100/120 mesh, ShinCarbon ST, 2 m, 1/16 in. OD, 1.0 mm ID (cat.# 19808) |
| **Standard/Sample** | Permanent gases-C1+C2 hydrocarbons |
| **Injection** | |
| Inj. Vol.: | 5 µL packed on-column |
| Inj. Temp.: | 100 °C |
| **Oven** | |
| Oven Temp.: | 40 °C (hold 3 min) to 250 °C at 8 °C/min (hold 10 min) |
| **Carrier Gas** | He, constant flow |
| Flow Rate: | 10 mL/min |
| **Detector** | HID @ 200 °C |

ShinCarbon ST is a highly stable material. Its 300 °C upper temperature limit minimizes bleed and baseline rise during temperature programming, making the material compatible with most detection systems used for gas analysis, including TCD or HID. All ShinCarbon ST columns are fully conditioned in an oxygen/moisture-free environment to prevent contamination. This minimizes stabilization time (less than 30 minutes) when installing a new column, which, in turn, minimizes downtime.

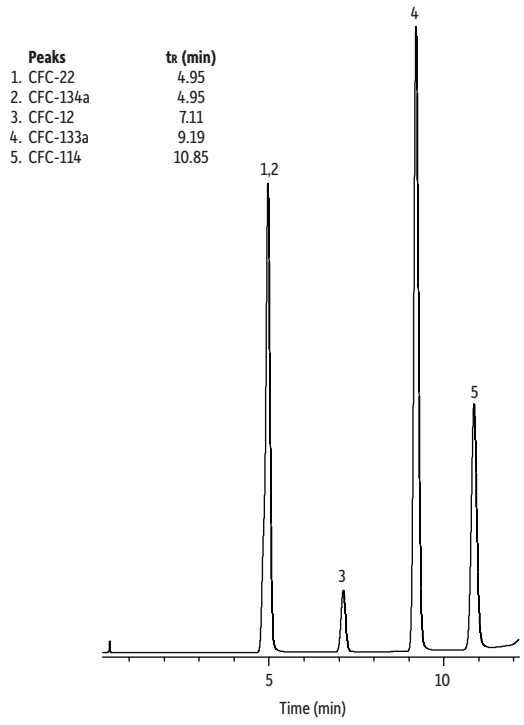
The unique properties of ShinCarbon ST make it an ideal packing material for analyses of gases and highly volatile compounds, including permanent gases, low molecular weight hydrocarbons, and fluorocarbon gases. The rapid, above-ambient analyses these columns provide will be a great convenience. Excellent thermal stability of the high-surface-area carbon, combined with careful conditioning during column manufacture, ensures low-bleed operation and rapid stabilization when installing a new column. Custom-made ShinCarbon ST columns are available on request.

**Figure 3:** Separate components in natural gas.




| | |
|---|---|
| **Column** | 100/120 mesh on ShinCarbon ST, SilcoSmooth tubing, 1 m, 1/16 OD, 1.0 mm ID (cat.# 19809) |
| **Standard/Sample** | C1-C6 hydrocarbons |
| Conc.: | 0.5-8% varied |
| **Injection** | packed on-column |
| Inj. Temp.: | 200 °C |
| **Oven** | |
| Oven Temp.: | 125 °C to 250 °C at 16 °C/min (hold 25.2 min) |
| **Carrier Gas** | He, constant flow |
| Flow Rate: | 10 mL/min |
| **Detector** | FID @ 250 °C |

**Figure 4:** Fluorocarbon analysis completed in 11 minutes on ShinCarbon ST column.




| | |
|---|---|
| **Column** | 100/120 mesh on ShinCarbon ST, SilcoSmooth tubing, 1 m, 1/16 OD, 1.0 mm ID (cat.# 19809) |
| **Standard/Sample** | Fluorocarbon blend |
| Conc.: | ~1-3% each |
| **Injection** | |
| Inj. Vol.: | 5 µL packed on-column |
| Inj. Temp.: | 200 °C |
| **Oven** | |
| Oven Temp.: | 125 °C to 320 °C at 16 °C/min |
| **Carrier Gas** | He, constant flow |
| Flow Rate: | 10 mL/min |
| **Detector** | FID @ 250 °C |

19043

## ShinCarbon ST Micropacked Columns

SilcoSmooth Stainless Steel

Note: Columns do not include column nuts and ferrules. Optional installation kits can be ordered separately.

| Description | Mesh | ID | OD | Length | Temp. Limits | Material | qty. | cat.# |
|---|---|---|---|---|---|---|---|---|
| ShinCarbon ST Micropacked Column | 80/100 | 0.53 mm | 0.74 mm | 1 m | up to 300 °C | SilcoSmooth Tubing | ea. | 19045 |
| | 80/100 | 0.53 mm | 0.74 mm | 2 m | up to 300 °C | SilcoSmooth Tubing | ea. | 19043 |
| | 100/120 | 0.75 mm | 0.95 mm | 1 m | up to 300 °C | SilcoSmooth Tubing | ea. | 19810 |
| | 100/120 | 1.00 mm | 1/16" | 1 m | up to 300 °C | SilcoSmooth Tubing | ea. | 19809 |
| | 100/120 | 1.00 mm | 1/16" | 2 m | up to 300 °C | SilcoSmooth Tubing | ea. | 19808 |

80486-800

## ShinCarbon ST Packed Columns

SilcoSmooth Stainless Steel

Note: Columns do not include column nuts and ferrules. Optional installation kits can be ordered separately.

| Description | Mesh | ID | OD | Length | Column Config | Material | qty. | cat.# |
|---|---|---|---|---|---|---|---|---|
| ShinCarbon ST Packed Column | 80/100 | 2.0 mm | 1/8" | 2 m | General | SilcoSmooth Tubing | ea. | 80486-800 |
| | 80/100 | 2.0 mm | 1/8" | 2 m | Agilent | SilcoSmooth Tubing | ea. | 80486-810 |
| | 80/100 | 2.0 mm | 1/8" | 2 m | Varian | SilcoSmooth Tubing | ea. | 80486-820 |
| | 80/100 | 2.0 mm | 1/8" | 2 m | PE Auto Sys | SilcoSmooth Tubing | ea. | 80486-840 |

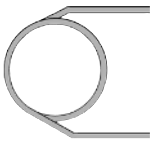
**Column Configuration Key:**
**-800** General—General Configuration
**-810** Agilent—(HP) 5880, 5890, 5987, 6890, 7980
**-820** Scion (Bruker 430, 450) (Varian 3700, Vista Series, FID)
**-830** PE/Sigma—PE 900-3920, Sigma 1, 2, 3
**-840** PE Auto Sys—PE Auto System 8300/8400/8700, Clarus 500
**-850** Shimadzu 14A—Shimadzu 14A, 2014
Other column configurations available.
Note: Columns do not include column nuts and ferrules. Optional installation kits can be ordered separately.

## ordering notes

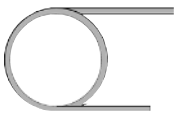
Custom packed and micropacked column also available by request.

## Column Instrument Configurations

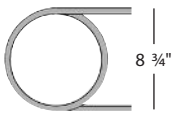
General Configuration:
Suffix -800



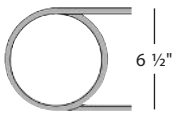
Agilent 5880, 5890, 5987, 6890, 7890:
Suffix -810



Varian 3700, Vista Series, FID:
Suffix -820




PE 900-3920, Sigma 1,2,3:
Suffix -830




PE Auto System 8300, 8400, 8700:
Suffix -840

Note: Initial 2" of column will be empty to accommodate a needle. For a completely filled column, add suffix -901.

Agilent configuration also includes 1 1/2" void on detector side.

21065

## Installation Kits for Micropacked Columns

| Description | Includes | Used with | qty. | cat.# |
|---|---|---|---|---|
| Micropacked Column Installation Kit | 1/16" Valco nut (1); 1/16" stainless-steel nut (1); 1/16" Vespel/graphite ferrule (1); 1/16" graphite ferrule (1); stainless-steel ferrule (1); 1/16" stainless-steel front ferrule (1); 1/16" stainless-steel back ferrule (1) | for 1 mm ID columns; for valve applications. | kit | 21065 |
| | 1/16" stainless-steel nuts (2); 1/16" Vespel/graphite ferrules (2); 1/16" graphite ferrules (2); 1/16" stainless-steel front ferrules (2); 1/16" stainless-steel back ferrules (2) | for 1 mm ID columns; for direct injections. | kit | 21066 |

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



**www.restek.com**

Lit. Cat.# PCSS1472B-UNV