

## Product Information

### Carboxen GC PLOT Capillary Columns

#### Supelco PLOT Columns

Supelco PLOT columns are an ideal choice for many permanent gases and light hydrocarbon analyses in the petrochemical industry.

Supelco PLOT columns are prepared using a proprietary patented adhesive technology that firmly bonds the adsorbent particles to the wall of the capillary column. The adhesive also bonds the particles to each other, eliminating particle loss during routine analysis or rapid temperature programming. A significant feature of the adhesive is its high temperature limit, greater than 360 °C, which makes the operating temperature of the column a function of the particles used, not the adhesive.

Supelco PLOT columns are individually tested for efficiency, inertness, and retention. Each column is shipped with a chromatogram demonstrating column performance that can be expected.

#### Carboxen Capillary PLOT Columns

Carboxen™ PLOT columns are the appropriate choice for permanent gas mixtures that include permanent gases and C1 to C3 hydrocarbons. Carboxen PLOT column chemistry is based on synthetic, spherical carbon molecular sieves that are synthesized in-house

under carefully controlled conditions. Each Carboxen has a unique combination of pore size, pore structure, and surface area. These two features permit analyte separations not possible with other PLOT columns.

#### Carboxen-1010

A larger pore structure (7 Å) and increased number of pores make Carboxen-1010 PLOT columns the preferred choice over zeolite Mol Sieve 5A PLOT columns for effectively separating oxygen, nitrogen, and larger analytes up to C3. Because the Carboxen surface is hydrophobic, samples containing water do not cause retention time shifts, eliminating the need for thermal conditioning as necessary with Mol Sieve 5A PLOT columns.

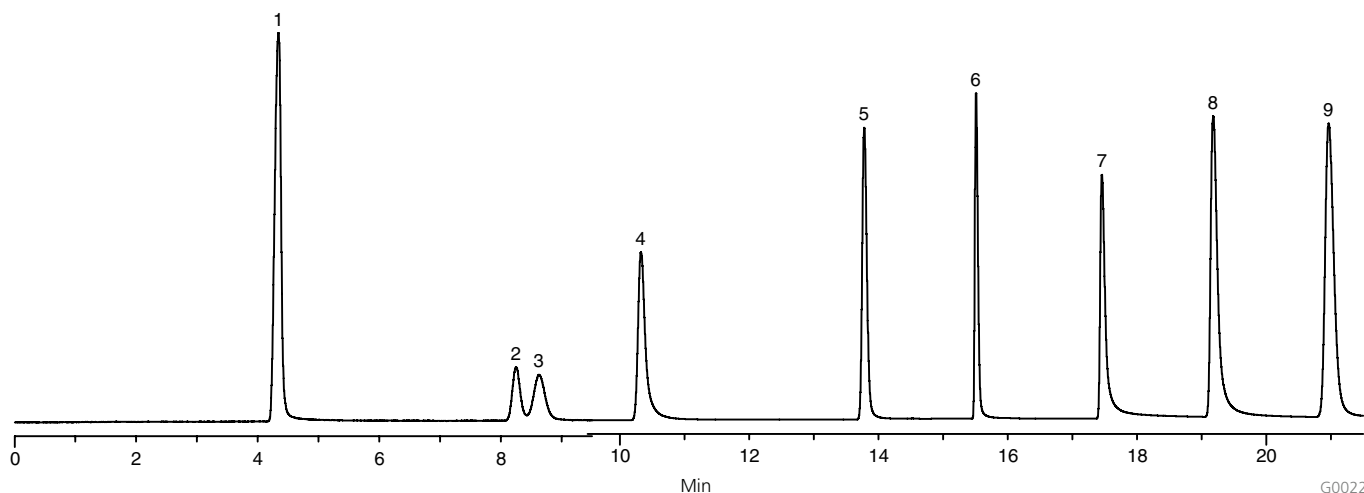
#### Carboxen-1006

Carboxen-1006 has a multiporous pore structure. The presence of large macropores and mesopores allow for effective access of the 7 Å micropores for fast kinetic applications. This unique pore structure makes Carboxen 1006 suitable for permanent gases and light hydrocarbons. The inert surface chemistry makes it an excellent choice for formalin analyses.

**Figure A. Transformer Gas Analysis for ASTM Method D3612-96 on Carboxen-1010 PLOT Column**

column: Carboxen-1010 PLOT, 30 m x 0.53 mm I.D. (25467)  
 oven: 35 °C (7.5 min.) to 250 °C at 24 °C/min.  
 inj.: 200 °C  
 det.: TCD/methanizer-FID, 230 °C  
 flow rate: Argon, 3.0 mL/min.  
 valve: 150 °C  
 injection: 10.0 µL valve injection  
 sample: 500 ppm each, transformer gas for ASTM Method D3612-96

1. Hydrogen
2. Oxygen
3. Nitrogen
4. Carbon monoxide
5. Methane
6. Carbon dioxide
7. Acetylene
8. Ethylene
9. Ethane

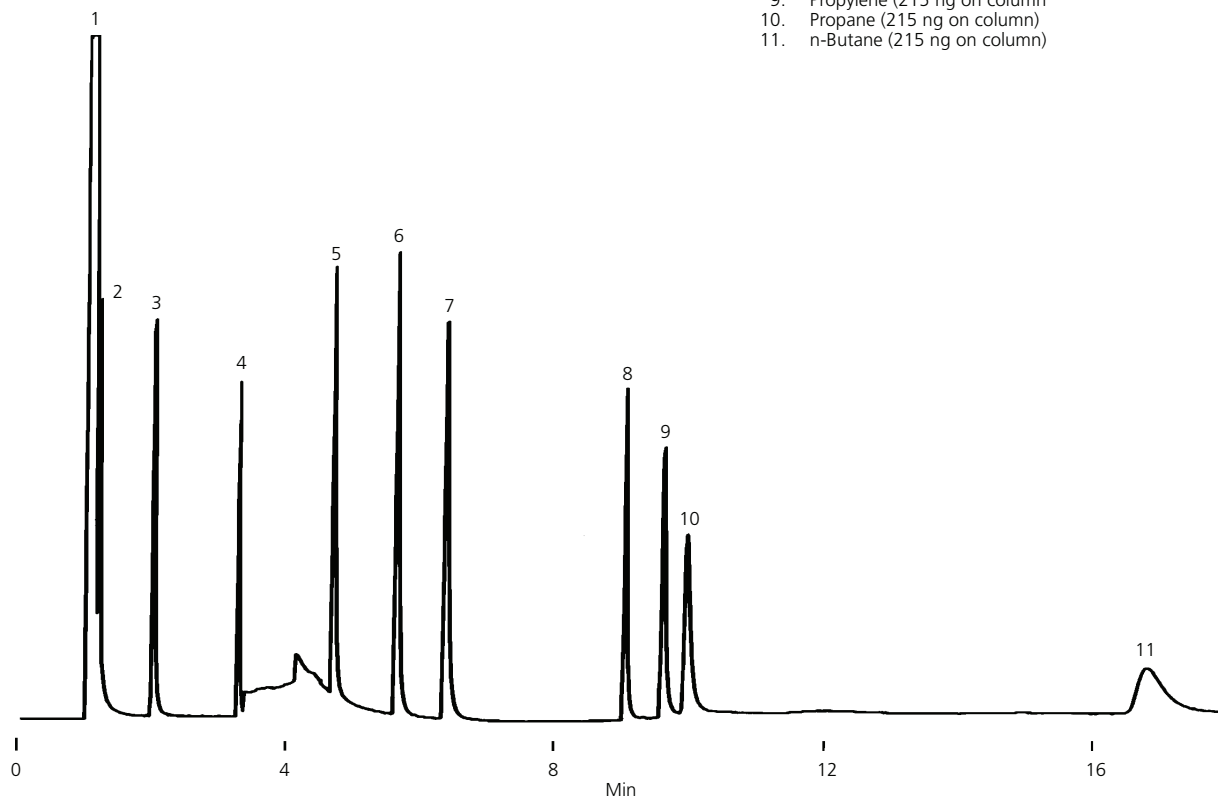


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## Figure B. Permanent Gases with C2 to C4 Hydrocarbons on Carboxen-1006 PLOT Column

column: Carboxen-1006 PLOT, 30 m x 0.53 mm I.D. (25461)  
 oven: 35 °C (1.0 min.) to 250 °C at 24 °C/min.  
 inj.: 200 °C  
 det.: TCD, 230 °C  
 flow rate: Helium, 10.0 mL/min.  
 valve: 150 °C  
 injection: 10.0 µL valve injection  
 sample: Permanent gases and C2 to C4 hydrocarbon mix

1. Nitrogen (bulk)
2. Carbon monoxide (215 ng on column)
3. Methane (430 ng on column)
4. Carbon dioxide (215 ng on column)
5. Water impurity
6. Acetylene (430 ng on column)
7. Ethylene (430 ng on column)
8. Ethane (430 ng on column)
9. Methyl acetylene (215 ng on column)
10. Propylene (215 ng on column)
11. Propane (215 ng on column)
12. n-Butane (215 ng on column)



794-0618

### Ordering Information:

#### Carboxen-1010 PLOT

Dimension	Max. Temp.	Cat. No.
30 m x 0.32 mm I.D.	250 °C	<b>24246</b>
30 m x 0.53 mm I.D.	250 °C	<b>25467</b>

#### Carboxen-1006 PLOT

Dimension	Max. Temp.	Cat. No.
30 m x 0.32 mm I.D.	250 °C	<b>24241-U</b>
30 m x 0.53 mm I.D.	250 °C	<b>25461</b>

#### Trademark

Carboxen - Sigma-Aldrich Co.

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