

## Detailed Hydrocarbon Analysis (DHA)

**Rtx®-1PONA** (nonpolar phase; Crossbond® 100% dimethyl polysiloxane)

- Application-specific columns meet ASTM and CGSB requirements for detailed hydrocarbon analysis.
- Stable to 340°C.

please **note**

To achieve critical resolutions, a 5-meter tuning column is connected to the analytical column and adjusted to the needed length through a series of trial analyses.

The Rtx®-1PONA polymer was designed to offer the exact polarity necessary to resolve hydrocarbons in the specific order requested by petrochemical companies. In order to meet the demanding resolution and retention criteria of the American Society for Testing and Materials (ASTM) and the Canadian General Standards Board (CGSB), Restek has developed unique quality control tests and specifications for the Rtx®-1PONA column. The measured values for retention (*k*), efficiency (*n*), and stationary phase selectivity (RI) are controlled so that each column exceeds the requirements of the ASTM and CGSB methods.

**Rtx®-1PONA Column** (fused silica)

(Crossbond® 100% dimethyl polysiloxane—optimized for hydrocarbon analysis)

ID	df (μm)	temp. limits	100-Meter
0.25mm	0.50	-60 to 300/340°C	10195

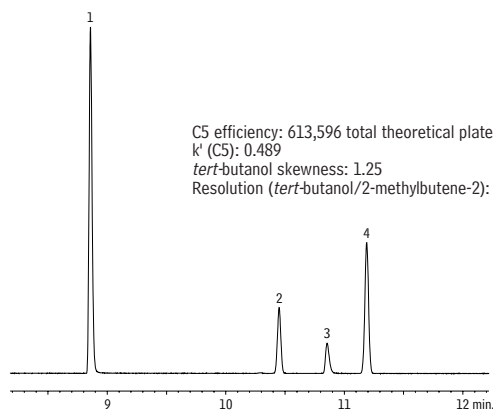
similar **phases**

Petrocol DH, DB-Petro, HP-PONA

**Rtx®-5PONA Tuning Column** (fused silica)

(Crossbond® 5% diphenyl/95% dimethyl polysiloxane)

ID	df (μm)	temp. limits	5-Meter
0.25mm	1.0	-60 to 325°C	10196

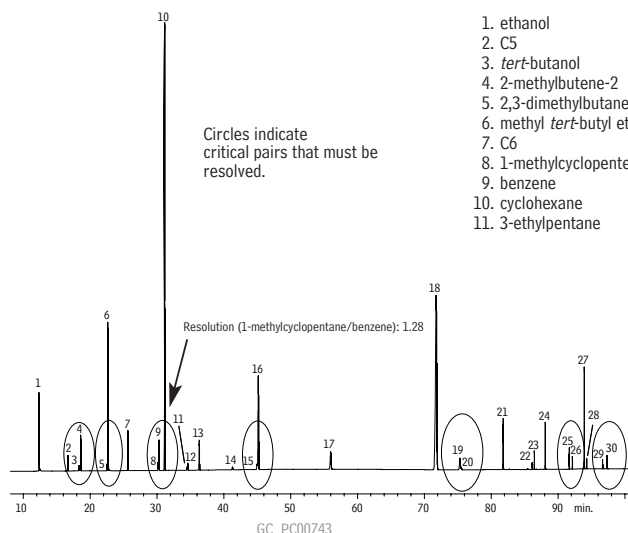
**Sharp, symmetric peak for ethanol (gasoline oxygenate), using an Rtx®-1PONA column.\*\***

C5 efficiency: 613,596 total theoretical plates  
*k'* (C5): 0.489  
*tert*-butanol skewness: 1.25  
 Resolution (*tert*-butanol/2-methylbutene-2): 5.60

1. ethanol
2. C5
3. *tert*-butanol
4. 2-methylbutene-2

**Rtx®-1PONA column  
 produces near  
 symmetrical alcohol peaks!**

\*\*P=paraffins; O=olefins; N=naphthenes; A=aromatics.  
 In alternate terminology: paraffins & isoparaffins = alkanes;  
 naphthenes = cyclic alkanes; olefins = alkenes.

**Critical pairs of gasoline components resolved per ASTM specifications, using an Rtx®-1PONA column.**

Circles indicate critical pairs that must be resolved.

1. ethanol
2. C5
3. *tert*-butanol
4. 2-methylbutene-2
5. 2,3-dimethylbutane
6. methyl *tert*-butyl ether (MTBE)
7. C6
8. 1-methylcyclopentane
9. benzene
10. cyclohexane
11. 3-ethylpentane
12. 1-*tert*-2-dimethylcyclopentane
13. C7
14. 2,2,3-trimethylpentane
15. 2,3,3-trimethylpentane
16. toluene
17. C8
18. ethylbenzene
19. *p*-xylene
20. 2,3-dimethylheptane
21. C9
22. 5-methylnonane
23. 1,2-methylethylbenzene
24. C10
25. C11 (undecane)
26. 1,2,3,5-tetramethylbenzene
27. naphthalene
28. C12 (dodecane)
29. 1-methylnaphthalene
30. C13 (tridecane)

Column: Rtx®-1PONA, 100m, 0.25mm ID, 0.5μm (cat.# 10195)  
 plus Rtx®-5PONA tuning column, 2.62m, 0.25mm ID,  
 1.0μm, connected via Press-Tight® connector  
 (cat.# 20446)  
 Sample: custom detailed hydrocarbon analysis  
 (DHA) mix, neat  
 Inj.: 0.01μL, split (split ratio 150:1), 4mm cup  
 inlet liner (cat.# 20709)  
 Inj. temp.: 200°C  
 Carrier gas: helium, constant flow  
 Linear velocity: 28cm/sec. (2.3mL/min.)  
 Oven temp.: 5°C (hold 15 min.) to 50°C @ 5°C/min. (hold  
 50 min.) to 200°C @ 8°C/min. (hold 10 min.)  
 Det.: FID @ 250°C