



Thermo Scientific TraceGOLD GC Capillary Columns

Redefining your expectations for GCMS

Offering you a leap forward in column performance delivering ultra low bleed, superior inertness and the highest levels of reproducibility guaranteed.

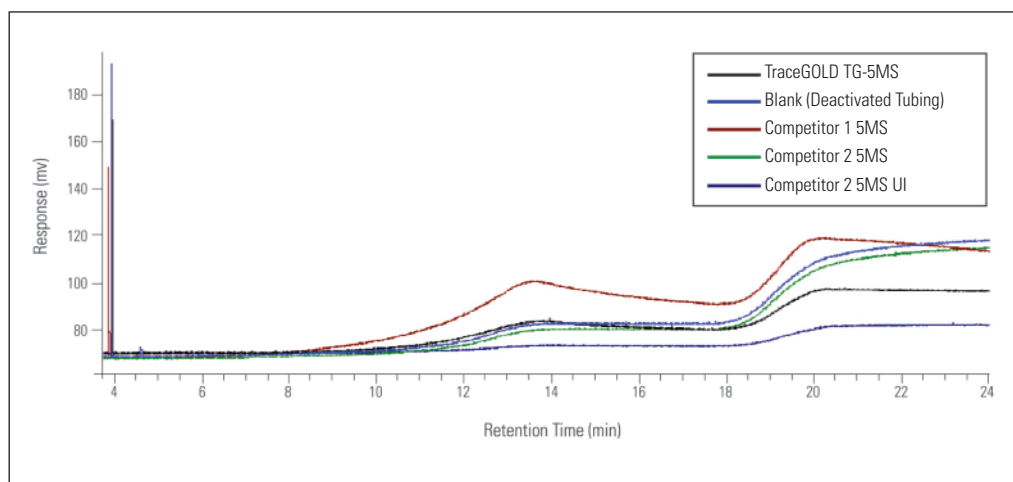
- ▶ **Ultra low bleed** – Leading to greater sensitivity, essential for GCMS applications, while providing extended column lifetime.
- ▶ **High levels of reproducibility** – Both run-to-run and column to column reproducibility. Expect every column to provide the same high levels of performance as the previous one. **Guaranteed.**
- ▶ **Superior inertness** – Offering highly inert columns ensuring excellent peak shape and sensitivity, especially for highly active or difficult compounds.

TraceGOLD GC Columns demonstrate ultra low bleed

Low bleed columns are essential for the integrity of analytical results. The amplitude of baseline noise associated with column bleed is indicative of stationary phase stability. A low bleed, stable column produces consistent results, and the low baseline noise enables improved limits of detection with enhanced resolution of low level analytes. Column bleed also contributes to contamination of the MS; minimizing column bleed extends the interval between scheduled maintenance, leading to higher productivity.

This test focuses on the high temperature range close to the operating limits of the columns used, where column bleed is most observable. Columns are held at 325°C for 5 minutes and then the temperature is ramped to 350°C where it is held for another 5 minutes. It can be seen from Figure 1 that the TraceGOLD TG-5MS GC column offers the lowest column bleed of the five columns tested, particularly at the higher temperature of 350°C.

Figure 1: Column bleed obtained from TraceGOLD TG-5MS GC column and 4 leading competitors, clearly demonstrating the low bleed characteristics of this column.



TraceGOLD GC columns ensure excellent run-to-run reproducibility

Run-to-run reproducibility is essential for all analytical laboratories. An advantage of low column bleed columns is the greater reproducibility of the stationary phase over a period of time leading to greater run-to-run reproducibility.

The run-to-run reproducibility of the Thermo Scientific TraceGOLD TG-5MS GC column was assessed over 100 runs using a mixture of phenol standards. Figure 2 demonstrates that over a series of 100 injections, the TraceGOLD column provides excellent run-to-run reproducibility.

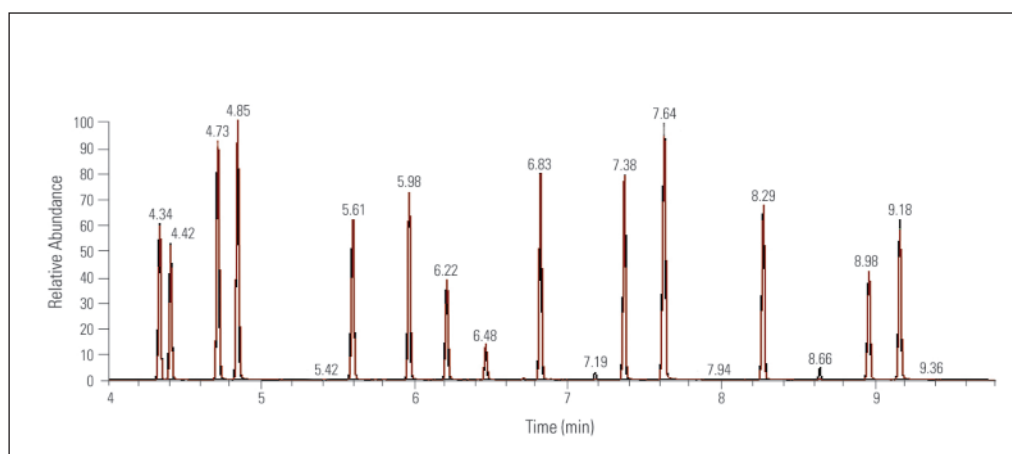


Figure 2: Overlay of 100 chromatograms showing the column robustness over 100 injections, with excellent retention time stability.



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TraceGOLD GC columns ensure excellent batch-to-batch reproducibility

It is essential that there is column to column batch reproducibility. Failure to obtain the same high levels of performance for the same type of column can result in methods having to be revalidated and potential doubt being cast on the original data generated. In this test three different columns produced from three different production batches were tested to demonstrate the level of

reproducibility. Each column was initially conditioned at 350°C and then used over five runs to analyze a standard mixture of phenols using an identical set of run conditions for each batch. The data shows that there is excellent batch-to-batch reproducibility for the TraceGOLD TG-5MS GC column.

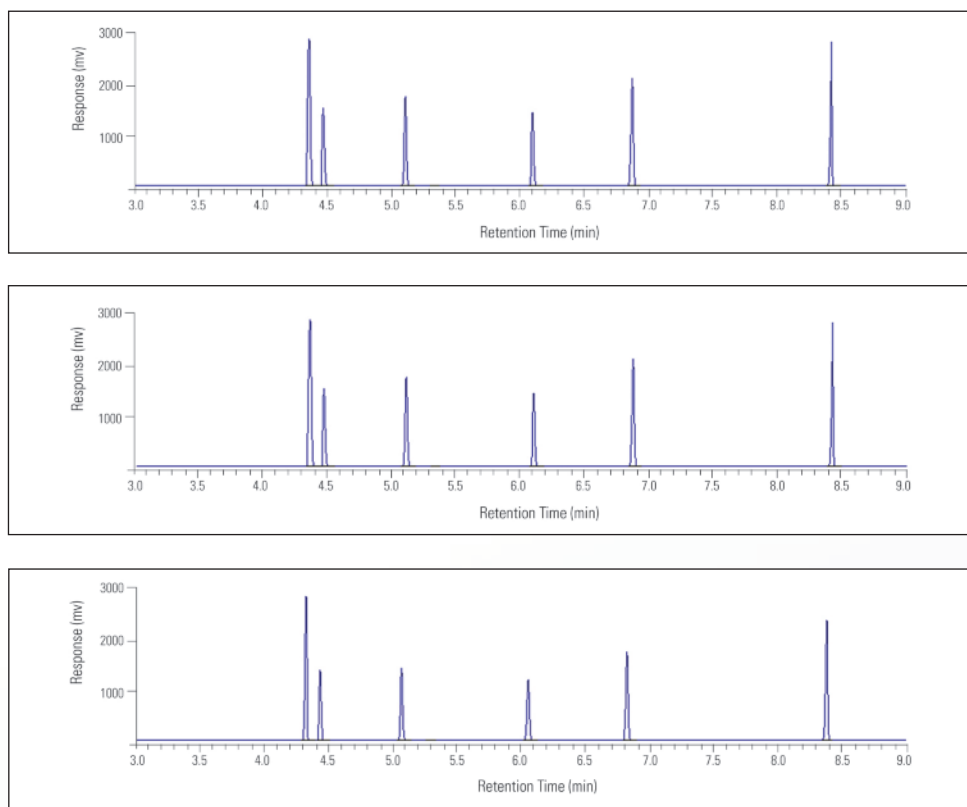


Figure 3: Analysis of a series of phenols using columns made from different batches. The data demonstrates the excellent batch-to-batch reproducibility obtained with the TraceGOLD TG-5MS GC column.



TraceGOLD GC columns enable analysis of difficult compounds

The acidic nature of the silanol groups prevalent within many GC columns can result in the adsorption of basic compounds, which frequently leads to peak tailing. Poor peak shape affects the sensitivity of an assay, as well as the robustness, as demonstrated in Figure 3.

Treatment of the analytical column by the bonding of basic functional groups onto the column surface reduces the effects of tailing and improves run-to-run reproducibility and sensitivity. Comparison of the chromatograms obtained for the analysis of 4-Picoline and Trimethyl Phosphate, demonstrates the substantially reduced tailing offered by the TraceGOLD TG-5MS AMINE column compared to the competition.

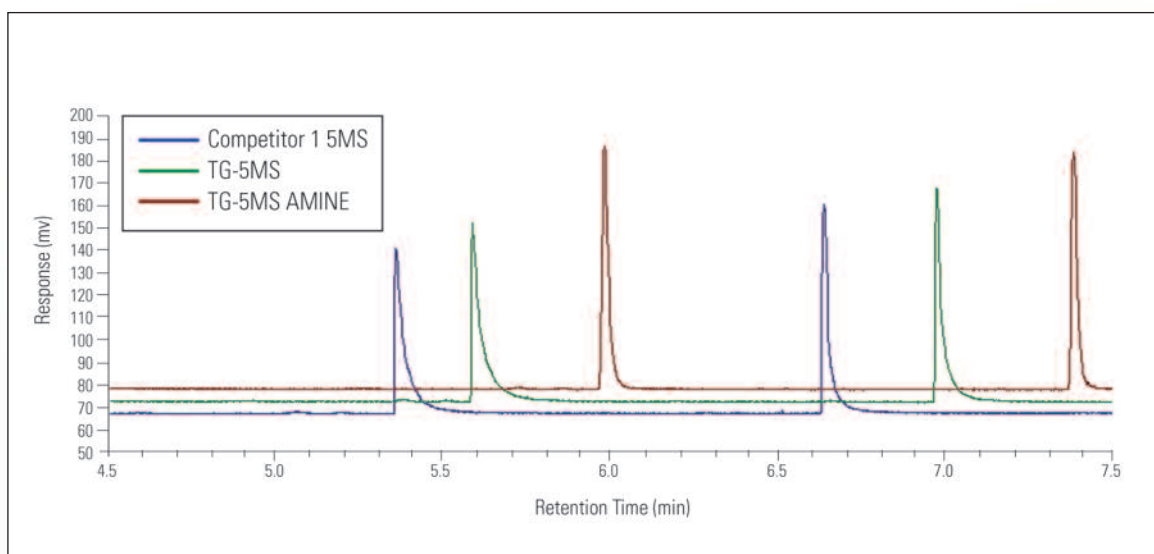
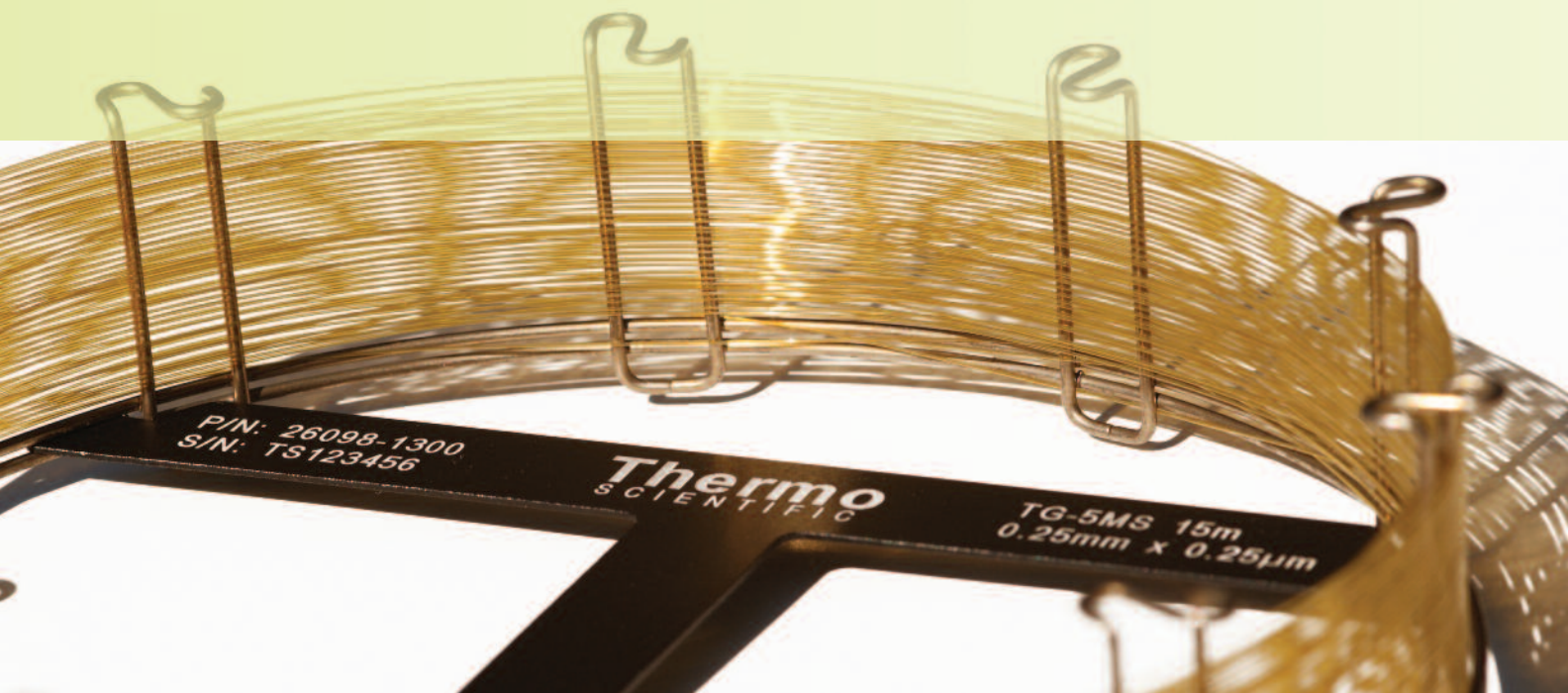


Figure 4: Using the treated TraceGOLD AMINE column substantially reduces the effect of tailing and increases the sensitivity of the assay compared to other columns.



TraceGOLD Column Phase Information

Column	Stationary Phase	Polarity	Maximum Operating Temperature
TG-1MS	100% Dimethyl Polysiloxane	Non-Polar	330°C / 350°C
TG-5MS	5% Phenyl Methylpolysiloxane	Non-Polar	330°C / 350°C
TG-SQC	Proprietary	Non-Polar	330°C / 350°C
TG-5MS AMINE	Base optimized 5% Phenyl Methylpolysiloxane	Non-Polar	300°C / 315°C
TG-5SILMS	Similar to 5% Phenyl Methylpolysiloxane	Non-Polar	330°C / 350°C
TG-5HT	5% Phenyl Methylpolysiloxane	Non-Polar	380°C / 400°C
TG-35MS	35% Phenyl Methylpolysiloxane	Mid-Polarity	300°C / 320°C
TG-35MS AMINE	Base optimized 35% Phenyl Methylpolysiloxane	Mid-Polarity	220°C
TG-17MS	50% Phenyl Polysiloxane	Mid-Polarity	300°C / 320°C
TG-1301MS	6% Cyanopropylphenyl Methylpolysiloxane	Mid-Polarity	260°C / 280°C
TG-624	6% Cyanopropylphenyl Methylpolysiloxane	Mid-Polarity	240°C
TG-1701MS	14% Cyanopropylphenyl Methylpolysiloxane	Mid-Polarity	260°C / 280°C
TG-225MS	50% Cyanopropylmethyl Phenylmethylpolysiloxane	Mid-Polarity	240°C
TG-200MS	Trifluoropropyl Methylpolysiloxane	Mid-Polarity	320°C / 340°C
TG-POLAR	90% Cyanopropyl Phenylcyanopropyl Polysiloxane	Polar	275°C
TG-WAXMS	Polyethylene Glycol (PEG)	Polar	260°C
TG-WAXMS A	Acid optimized Polyethylene Glycol (PEG)	Polar	250°C
TG-WAXMS B	Base optimized Polyethylene Glycol (PEG)	Polar	220°C



	TG-1MS	TG-5MS TG-5SiMS TG-5MS AMINE	TG-35MS TG-35MS AMINE	TG-17MS	TG-1301MS	TG-1701MS	TG-1WAXMS	TG-WAXMS A	TG-WAXMS B	TG-POLAR	TG-624	TG-200MS	TG-225MS	TG-5HT
Acids		X					X	X						
Acid / Neutral Drugs		X	X											
Alcohols		X			X		X	X	X	X	X	X		
Alcohols in Beverages					X		X	X	X		X			
Aldehydes							X	X	X	X				
Alditol Acetates (Sugars)		X					X	X	X				X	
Amines – Aliphatic		X	X		X		X		X		X			
Amines – Aromatic		X	X		X		X		X		X			
Antidepressants		X	X											
Benzenes, substituted														X
Biodiesel – Methanol														
Biodiesel – FAMES										X				
Biodiesel – Glycerine														
Brominated Flame Retardants		X												
Butter Fat		X												X
Carboxylic Acids														
Cigarette Lighter Fuel		X			X						X			
Chlorinated Aromatics	X	X	X			X						X		
Dioxins		X		X										
Drugs of Abuse														
Drugs of Abuse - THC			X											
Essential Oils							X	X	X					
Explosives														
FAMES										X			X	X
Glucose – Methylated														
Herbicides		X	X	X		X	X	X	X	X		X		
Hydrocarbons														
Ketones				X	X	X	X	X	X	X	X	X	X	
Monomers					X						X			
Nitroaromatics		X	X	X		X	X	X	X	X				
Organic acids														
Organochlorine Pesticides	X	X	X	X		X						X		
Organophosphorous Pesticides	X	X	X	X										
PAHs	X	X	X	X		X								X
Paraffins	X	X												
PCBs		X												
Pesticides						X								
Petroleum														X
Phenols		X	X				X	X	X	X		X		
Phthalates	X	X												
Plant Sterols		X	X	X										
Polyethylene														X
Polymers	X													
Polywax	X	X												X
Pyrethroids	X	X	X	X		X								
Sedatives		X	X											
Semivolatiles	X	X												
Silicon Oil														X
Solvents					X		X	X	X	X	X			
Terpenes		X												
Triglycerides		X												X
TRPH	X	X												
Volatiles		X			X		X	X	X	X	X			
Xylenes	X	X					X	X	X					

X = Recommended
X = Alternative

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ADDITIONAL INFORMATION

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