



GC COLUMN

GUIDE

Powerful Gas Chromatography, Mass Spectrometry
and Chromatography Data System Solutions.



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GC Column Reference Guide

SCION Instruments offers the highest quality, most reproducible GC capillary, PLOT and packed columns, with the most demanding quality assurance specifications in the industry.

GC Column Reference guide by phase

SCION Column	Phase Composition/Porous Layer	Application
SCION-1/ SCION-1MS	100% Dimethylpolysiloxane Low bleed, highly inert	Alcohols, aromatic hydrocarbons, esters, flavours and aromas, free fatty acids, glycols, halogenated hydrocarbons, hydrocarbons, ketones, organic acids, oxygenates, PAHs, pesticides, polymers, steroids, solvents, sulphur compounds
SCION-5/ SCION-5MS	Equivalent to 5% phenyl /95% dimethylpolysiloxane Low bleed, highly inert	Alcohols, amines, hydrocarbons, bile acids, drugs, EPA methods, FAME, flavours and aromas, glycerides, halogenated compounds, PAHs, PCBs, pesticides, steroids, sterols, sugars, sulphur compounds
SCION-WAXMS	Ultra low bleed, polar phase Crossbond polyethylene glycol	Trace analysis of polar substances
SCION-624MS	Equivalent of a 6% cyanopropylphenyl/ 94% dimethylpolysiloxane Ultra low bleed, highly inert	Purgeable organic volatiles and semi-volatiles, aromatics, halocarbons, solvents
SCION-1701	14% cyanopropyl-phenyl/ 86% dimethylpolysiloxane Low bleed, highly inert	Organic compounds in drinking water, base/neutrals and acids, PCBs and chlorinated pesticides, organophosphorus pesticides and herbicides
SCION-35MS	Equivalent to 35% phenyl/ 65% dimethylpolysiloxane Low bleed	Aromatic compounds, pesticides and herbicides, sterols and other substituted aromatic compounds
SCION-BOND Q	Bonded polystyrene divinylbenzene phase	Alcohols, short chain free fatty acids, gases, halogenated compounds, hydrocarbons, C1-C9, ketones, solvents, sulphur compounds
SCION-PLOT Q	Non bonded polystyrene divinylbenzene phase	Alcohols, short chain free fatty acids, gases, halogenated compounds, hydrocarbons, C1-C9, ketones, solvents, sulphur compounds
SCION-PLOT Q-HT	High temperature Non bonded polystyrene divinylbenzene phase	Halogenated hydrocarbons, hydrocarbons, solvents
SCION-Al2O3/Na2SO4	Aluminium oxide, Sodium Sulphate deactivated	Hydrocarbons C1-C10 and impurities in hydrocarbon mainstreams, benzene and toluene
SCION-Al2O3/KCl	Aluminium oxide, Potassium Chloride deactivated	Hydrocarbons C1-C10 and impurities in hydrocarbon mainstreams, benzene and toluene



SCION Columns for EPA Methods

EPA Method: Drinking Water

EPA Method	Application	SCION Capillary Column	Part No.
501.3	Measurement of trihalomethanes in drinking water GC/MS and selected ion monitoring	30 m x 0.53 mm df=3.0 µm SCION-624MS	SC32597
		30 m x 0.25 mm df=1.4 µm SCION-624MS	SC32591
502.2	Volatile organic compounds in water by purge and trap capillary column GC with photoionisation and electrolytic conductivity detectors in series	30 m x 0.53 mm df=3.0 µm SCION-624MS	SC32597
		30 m x 0.25 mm df=1.4 µm SCION-624MS	SC32591
504.1	1,2-Dibromoethane (EDB) and 1,2-dibromo-3-chloropropane (DBCP), GC, microextraction	30 m x 0.32 mm df=1.0 µm SCION-1MS	SC32135
505	Analysis of organohalide pesticides and commercial polychlorinated biphenyl (PCB) products in water by microextraction and GC	30 m x 0.32 mm df=1.0 µm SCION-1MS	SC32135
506	Determination of phthalate and adipate esters in drinking water by liquid-liquid extraction or liquid-solid extraction and GC with photoionisation detection	30 m x 0.32 mm df=0.25 µm SCION-5MS	SC32233
		30 m x 0.32 mm df=0.25 µm SCION-1MS	SC32133
507	Determination of nitrogen - and phosphorus-containing pesticides in water by GC with a nitrogen-phosphorus detector	30 m x 0.25 mm df=0.25 µm SCION-Pesticides	SC37423
508	Determination of chlorinated pesticides in water GC with an electron capture detector	30 m x 0.25 mm df=0.25 µm SCION-Pesticides	SC37423
508.1	Determination of chlorinated pesticides, herbicides, and organohalides by liquid-solid extraction and electron capture GC	30 m x 0.25 mm df=0.25 µm SCION-Pesticides	SC37423
515.3	Determination of chlorinated acids in drinking water by liquid-liquid extraction, derivatisation and GC with electron capture detection	30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32223
515.4	Determination of chlorinated acids in drinking water by liquid-liquid microextraction, derivatisation, and fast GC with electron capture detection	30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32223
521	Determination of nitrosamines in drinking water by solid phase extraction and capillary column gas chromatography with large volume injection and chemical ionisation tandem mass spectrometry (MS/MS)	30 m x 0.25 mm df=1.0 µm SCION-5MS	SC32225



SCION Columns for EPA Methods

EPA Method: Drinking Water

EPA Method	Application	SCION Capillary Column	Part No.
524.2	Measurement of purgeable organic compounds in water by capillary GC/MS	30 m x 0.53 mm df=3.0 µm SCION-624MS	SC32597
		30 m x 0.32 mm df=1.0 µm SCION-5MS	SC32225
525.2	Determination of organic compounds in drinking water by liquid-solid extraction and capillary column GC/MS	30 m x 0.25 mm df=0.25 µm SCION-Pesticides	SC37423
526	Determination of selected semi-volatile organic compounds in drinking water by solid phase extraction and capillary column GC/MS	30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32223
527	Determination of selected pesticides and flame retardants in drinking water by solid phase extraction and capillary column GC/MS	30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32223
528	Determination of phenols in drinking water by solid phase extraction and capillary column GC/MS	30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32223
529	Determination of explosives and related compounds in drinking water by solid phase extraction and capillary column GC/MS	15 m x 0.25 mm df=0.25 µm SCION-5MS	SC32220
551.1	Determination of chlorination disinfection byproducts, chlorinated solvents, and halogenated pesticides/herbicides in drinking water by liquid-liquid extraction and GC with electron capture detection	30 m x 0.25 mm df=1.0 µm SCION-1MS	SC32125
552.2	Determination of haloacetic acids and dalapon in drinking water by liquid-liquid extraction, derivatisation GC with electron capture detection	30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32223
552.3	Determination of haloacetic acids and dalapon in drinking water by liquid-liquid microextraction, derivatisation, and GC with electron capture detection	30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32223
556	Determination of carbonyl compounds in drinking water by pentafluorobenzylhydroxylamine derivatisation and capillary GC with electron capture detection	30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32223



SCION Columns for EPA Methods

EPA Method: Waste Water

EPA Method	Application	SCION Capillary Column	Part No.
601	Purgeable halocarbons	60 m x 0.32 mm df=1.8 µm SCION-624MS	SC32595
		30 m x 0.25 mm df=1.4 µm SCION-624MS	SC32591
602	Purgeable aromatics	30 m x 0.25 mm df=1.0 µm SCION-WAXMS	SC32425
		30 m x 0.25 mm df=1.4 µm SCION-624MS	SC32591
603	Acrolein and acrylonitrile	60 m x 0.32 mm df=1.8 µm SCION-624MS	SC32595
		60 m x 0.25 mm df=1.4 µm SCION-624MS	SC32592
604	Phenols	30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32223
		60 m x 0.32 mm df=1.8 µm SCION-624MS	SC32595
606	Phthalate esters	30 m x 0.25 mm df=1.4 µm SCION-624MS	SC32591
608	Organochlorine pesticides and PCBs	30 m x 0.25 mm df=0.25 µm SCION-Pesticides	SC37423
609	Nitroaromatics and isophorone	30 m x 0.25 mm df=0.5 µm SCION-5MS	SC32224
610	Polynuclear aromatic hydrocarbons	30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32223
611	Haloethers	30 m x 0.25 mm df=0.5µm SCION-5MS	SC32224
612	Chlorinated hydrocarbons	30 m x 0.25 mm df=1.0 µm SCION-5MS	SC32225
		30 m x 0.25 mm df=0.25 µm SCION-35MS	SC32323
615	Chlorinated herbicides	30 m x 0.25 mm df=0.25 µm SCION-Pesticides	SC37423
619	Triazine pesticides	30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32223
624	Purgeables	60 m x 0.32 mm df=1.8 µm SCION-624MS	SC32595
		30 m x 0.25 mm df=1.4 µm SCION-624MS	SC32591
625	Base/neutrals and acids	30 m x 0.25 mm df=0.25 µm SCION-Pesticides	SC37423
1613	Tetra-through octa-chlorinated dioxins and furans by isotope dilution HRGC/HRMS	60 m x 0.25 mm df=0.25 µm SCION-5MS	SC32226
1624	Volatile organic compounds by isotope dilution GC/MS	60 m x 0.25 mm df=1.4 µm SCION-624MS	SC32592
1625	Semi-volatile organic compounds by isotope dilution GC/MS	30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32223



SCION Columns for EPA Methods

EPA Method: Solid Waste

EPA Method	Application	SCION Capillary Column	Part No.
8011	1,2-Dibromoethane and 1,2-dibromo-3-chloropropane by microextraction and GC	30 m x 0.32 mm df=0.25 µm SCION-1MS	SC32233
8015c	Nonhalogenated organics by GC	30 m x 0.53 mm df=1.0 µm SCION-WAXMS	SC32455
8021b	Aromatic and halogenated volatiles by GC	60 m x 0.53 mm df=3.0 µm SCION-624MS 60 m x 0.25 mm df=1.4 µm SCION-624MS	SC32598 SC32592
8031	Acrylonitrile by GC	25 m x 0.53 mm df=10 µm SCION-BOND Q	SC35604
8061	Phthalate esters by GC with electron capture detection {GC/ECD}	30 m x 0.25 mm df=0.5 µm SCION-5MS	SC32223
8081	Organochlorine pesticides by GC	30 m x 0.25 mm df=1.0 µm SCION-5MS 30 m x 0.25 mm df=1.0 µm SCION-35MS	SC32225 SC32325
8082a	Polychlorinated biphenyls (PCBs) by GC	30 m x 0.25 mm df=1.0 µm SCION-5MS 30 m x 0.25 mm df=1.0 µm SCION-35MS	SC32225 SC32325
8100	Polynuclear aromatic hydrocarbons	30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32223
8111	Haloethers by GC	30 m x 0.25 mm df=0.5 µm SCION-5MS	SC32223
8121	Chlorinated hydrocarbons by GC: capillary column technique	30 m x 0.53 mm df=1.0 µm SCION-WAXMS	SC32455
8131	Aniline and selected derivatives by GC	30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32223
8141b	Organophosphorus compounds by GC	30 m x 0.53 mm df=1.0 µm SCION-35MS 30 m x 0.53 mm df=1.0 µm SCION-5MS	SC32356 SC32455
8151b	Chlorinated herbicides by GC using methylation or pentafluorobenzoylation derivatisation	30 m x 0.25 mm df=0.25 µm SCION-Pesticides 30 m x 0.32 mm df=1.0 µm SCION-5MS 30 m x 0.25 mm df=0.25 µm SCION-35MS 30 m x 0.53 mm df=1.0 µm SCION-35MS	SC37423 SC32235 SC32323 SC32356
8260b	Volatile organic compounds by GC/MS	30 m x 0.25 mm df=1.0 µm SCION-5MS 60 m x 0.32 mm df=1.8 µm SCION-624MS	SC32225 SC32595
8261	Volatile organic compounds by vacuum distillation in combination with GC/MS spectrometry {VD/GC/MS}	60 m x 0.53 mm df=3.0 µm SCION-624MS 60 m x 0.25 mm df=1.4 µm SCION-624MS	SC32598 SC32592



SCION Columns for EPA Methods

EPA Method: Solid Waste

EPA Method	Application	SCION Capillary Column	Part No.
8270d	Semi-volatile organic compounds by GC/MS	30 m x 0.25 mm df=0.1 µm SCION-5MS	SC32211
		30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32223
8275a	Semi-volatile organic compounds (PAHs and PCBs) in soils/sludges and solid wastes using thermal extraction/ gas chromatography/mass spectrometry (TE/GC/MS)	30 m x 0.25 mm df=0.5 µm SCION-5MS	SC32234
		30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32223
8290b	Polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) by high resolution gas chromatography/high resolution mass spectrometry (HRGC/HRMS)	30 m x 0.25 mm df=0.5 µm SCION-5MS	SC32224
8410	Gas chromatography/Fourier transform infrared (GC/FT-IR) spectrometry for semivolatile organics: capillary column	30 m x 0.32 mm df=0.25 µm SCION-5MS	SC32233
8430	Analysis of bis(2-chloroethyl) ether and hydrolysis products by direct aqueous injection (GC/FT-IR)	30 m x 0.53 mm df=1.0 µm SCION-WAXMS	SC32455

These columns have the dimensions and stationary phases on which the EPA methods were developed, and are suited for these applications. For most methods EPA permits other column dimensions and phases that deliver the test requirements as described in the method. For GC/MS applications this means that columns with IDs of 0.25 mm can be used.

The columns listed in this section were the columns used in developing the method. The listing of these columns in this method is not intended to exclude the use of other columns that are available or that may be developed. Laboratories may use these columns or other columns provided that the laboratories document method performance data (e.g., chromatographic resolution, analyte breakdown, and sensitivity) that are appropriate for the intended application.



SCION Columns for ASTM Methods



SCION INSTRUMENTS' GC ANALYSER SPECIALISTS HAVE THE KNOWLEDGE AND EXPERIENCE TO PROVIDE PRECONFIGURED GAS CHROMATOGRAPH SYSTEMS FOR HYDROCARBON PROCESSING APPLICATIONS THAT ARE READY, AT POWER-UP, TO HANDLE KEY APPLICATIONS.

Our extensive experience in designing, manufacturing, testing and commissioning complex hydrocarbon analysers ensures that you get the solution that's right for you. With a wide selection of standard analysers configured to meet the performance requirements of industry standard methods, SCION Instruments has the answers that you seek.



SCION Analyser Solutions

Benefits

SCION configures and tests GC hardware and software according to widely used industry-standard methods (e.g. ASTM, UOP, EN, ISO, GPA, ...), to save its clients time and to ensure confidence in results. Solutions are configured to meet the performance specifications outlined in the standard method.

Included with all SCION Analyser solutions:

- All hardware
- Software (including special plug-ins where appropriate)
- Pre-installed methods
- Test chromatograms
- Installations/validation data
- Trouble-shooting guide
- User documentation customised for the specific method





SCION Columns for ASTM Methods

EPA Method	Application	SCION Capillary Column	Part No.
D 2427	C2-C5 hydrocarbons in gasolines	50 m x 0.53 mm df=10 µm SCION-Al ₂ O ₃ /KCl	SC35202
D 2593	Butadiene purity and hydrocarbon impurity	50 m x 0.32 mm df=5.0 µm SCION-Al ₂ O ₃ /KCl 50 m x 0.53 mm df=10 µm SCION-Al ₂ O ₃ /KCl	SC35201 SC35202
D 2887	SimDist analysis of petroleum fractions	10 m x 0.53 mm df=2.65 µm SCION-SimDist Metal 25 m x 0.53 mm df=20 µm SCION-PLOT Q	SC37788 SC35102
D 3271	Solvent analysis in paints	2,5' X 1/8" Inert Steel 10% SE-30 Chrom W 80-100 mesh 15' X 1/8" Inert Steel 20% TCEP/Chrom P 80-100 mesh	SC15896 SC15940
D 3606	Benzene and toluene in gasoline	25 m x 0.32 mm df=5 µm SCION-BOND Q	SC35602
D 3792	Water in water-reducible paints	25 m x 0.53 mm df=10 µm SCION-BOND Q	SC35604
D 6229	Benzene in hydrocarbon solvents	30 m x 0.53 mm x 0.50 µm SCION-WAXMS	SC32454
D 5580	Aromatics in finished gasoline	56 cm X 1/16" Inert Steel 20% TCEP on Chrom P AW 30 m x 0.53 mm x 5.00 µm SCION-1	SC18643 SC30164
D 4332	Acrylonitrile in styrene-acrylonitrile-copolymers and nitrile rubber	25 m x 0.53 mm df=10 µm SCION-BOND Q	SC35604
D 4509	Acetaldehyde contents of PET bottles	25 m x 0.32 mm df=5 µm SCION-BOND Q 25 m x 0.53 mm df=10 µm SCION-BOND Q	SC35602 SC35604
D 7500	SimDist Analysis of Petrochemical Fractions, crudes	5 m x 0.53 mm df=0.17 µm SCION-SimDist Metal	SC37701



SCION-MS Columns

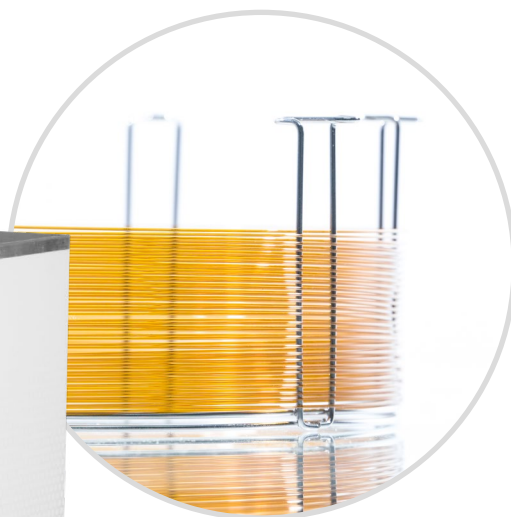
Highly Inert Capillary Columns with the Lowest Bleed

SCION-MS columns deliver greater analytical accuracy to give you the right result first time. They reduce costs and improve instrument uptime to enhance efficiency, so that you can analyse more compounds in less time and boost your productivity.

SCION-MS is a comprehensive line of high performance capillary gas chromatography (GC) columns. These columns are manufactured from the highest quality materials with the most detailed specifications across the product range to ensure reproducibility, ultra low bleed and high inertness for quality chromatography. Such high performance columns can be used routinely and with confidence in all areas of GC and GC/MS analysis.

Utilising advanced manufacturing techniques, the SCION-MS range provides highly inert columns that offer low background and high signal to noise values and minimal peak tailing. These combine to offer superior performance for routine or trace analysis for all GC detectors.

To meet every application and selectivity requirement, SCION-MS columns are available in a variety of general and application specific phases. All the benefits of high performance, low bleed and quality inertness are built into every SCION-MS column.





SCION-1MS

The Non-polar Column for Accuracy and Sensitivity

Included with all SCION Analyser solutions:

- Lowest guaranteed bleed specification for trace analysis with MS
- Wide range of applications ensures near universal applicability
- Highly inert for accurate analysis, even at trace levels

SCION-1MS is a highly inert, non-polar, low bleed GC column providing increased sensitivity over a broad array of applications. The 100% dimethylpolysiloxane phase delivers a guaranteed bleed specification of 1 pA @ 325 °C (30 m, 0.25 mm, 0.25 µm).

Typical Applications

Alcohols, aromatic hydrocarbons, esters, flavours and aromas, free fatty acids, glycols, hydrocarbons, halogenated hydrocarbons, ketones, organic acids, oxygenates, PAHs, pesticides, polymers, steroids, solvents, sulphur compounds.

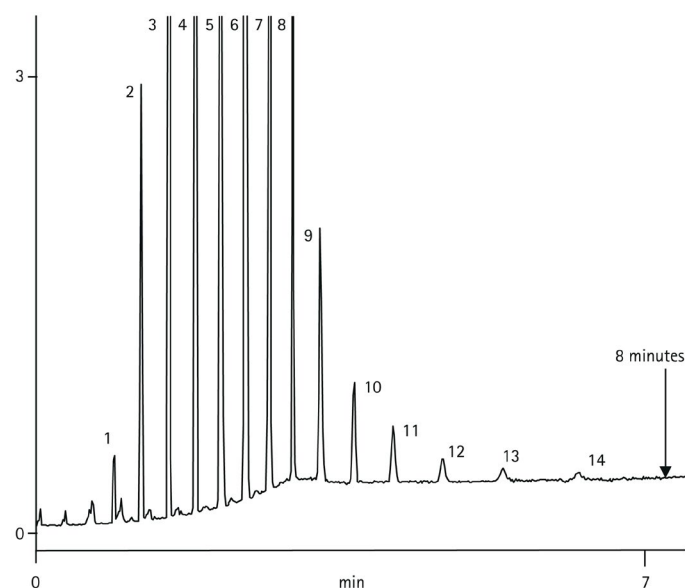
Ordering Information

SCION-1MS, Tmax-iso/Tmax-prog 325/350 °C, Tmin –60 °C

ID (mm)	Length (m)	df (µm)	Part No.
0.25	15	0.10	SC32110
0.25	30	0.10	SC32111
0.25	15	0.25	SC32120
0.25	30	0.25	SC32123
0.25	30	0.50	SC32124
0.25	30	1.00	SC32125
0.25	60	0.25	SC32126
0.25	60	1.00	SC32128
0.32	15	0.25	SC32130
0.32	30	0.25	SC32133
0.32	30	0.50	SC32134
0.32	30	1.00	SC32135
0.32	60	0.25	SC32136
0.32	60	1.00	SC32138
0.53	15	0.50	SC32151



Triglycerides C28-C54



Column	SCION-1MS, 15 m x 0.25 mm x 0.25 µm
Carrier Gas	Helium, 2 mL/min
Temp	250 °C to 375 °C, 35 °C
Injector	Split 1:10, T=340 °C
Detector	MS

Peak Identification

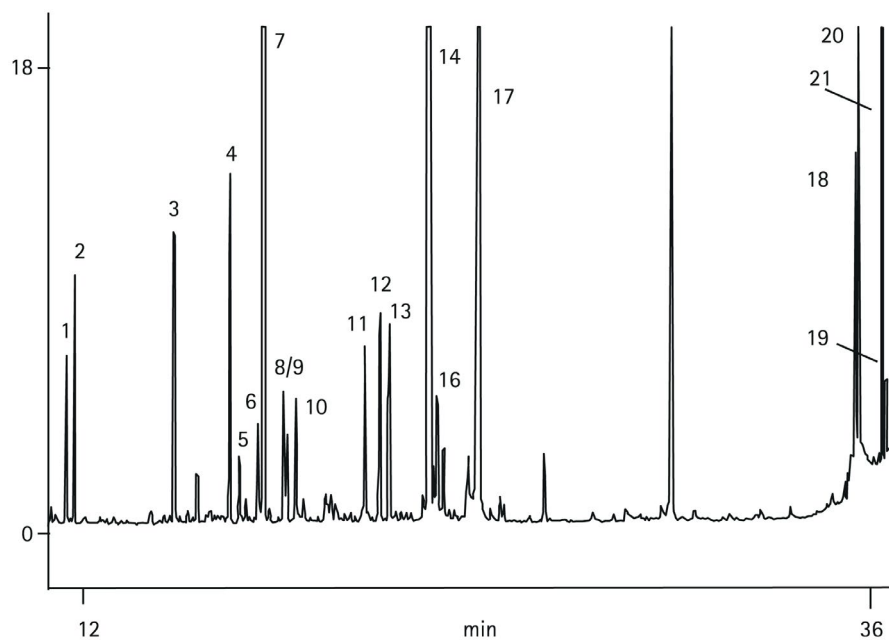
1. Tri-C28	6. Tri-C38	11. Tri-C48
2. Tri-C30	7. Tri-C40	12. Tri-C50
3. Tri-C32	8. Tri-C42	13. Tri-C52
4. Tri-C34	9. Tri-C44	14. Tri-C54
5. Tri-C36	10. Tri-C46	



SCION-1MS



Separation of TMS-derivatised sugars using SCION-1MS



Column	SCION-1MS, 30 m x 0.25 mm, df= 0.25 µm
Sample Size	5 µL, splitless 1 µL
Sample Conc	40 ppb
Carrier Gas	He, 1.0 mL/min
Temp	150 °C → 240 °C, 4 °C/min → 300 °C, 20 °C/min
Injector	Split; 1:15
Detector	MS

Peak Identification

1. Threitol	8. 3-O-Methylglucose 1	15. Sorbitol (not identified)
2. Erythritol	9. Xylose 2	16. Galactitol
3. Rhamnose 1	10. Rhamnitol	17. Glucuron acid
4. Rhamnose 2	11. 3-O-Methylglucose 2	18. Lactulose
5. Xylose 1	12. Glucuron acid-1,5-lacton	19. Lactose
6. Arabitol	13. Ribose 2	20. Sucrose
7. Ribitol	14. Manitol	21. Threhalose



SCION-5MS

The Multi-purpose GC Column

Included with all SCION Analyser solutions:

- Excellent selectivity for aromatic compounds
- Minimal column bleed improves sensitivity

SCION-5MS is a highly inert 5% phenyl-methyl column for increased sensitivity, accuracy and instrument uptime. The columns have the lowest guaranteed bleed specification of 1 pA @ 325 °C (30 m, 0.25 mm, 0.25 µm). SCION-5MS has a slightly higher polarity than the SCION-1MS resulting in a better selectivity for aromatic compounds. This selectivity, combined with superior inertness, also makes these columns applicable for a wide range of semi-polar and even polar components, such as phenols.

Typical Applications

Alcohols, amines, aromatic hydrocarbons, bile acids, drugs, EPA methods, esters, FAME, flavours and aromas, glycerides, halogenated compounds, herbicides, hydrocarbons, organic acids, oxygenates, nitrosamines, PAHs, PCBs, pesticides, phenols, polymers, prostaglandins, solvents, steroids, sterols, sugars, sulphur compounds.

Ordering Information

SCION-5MS, Tmax-iso/Tmax-prog 325/350 °C, Tmin –60 °C

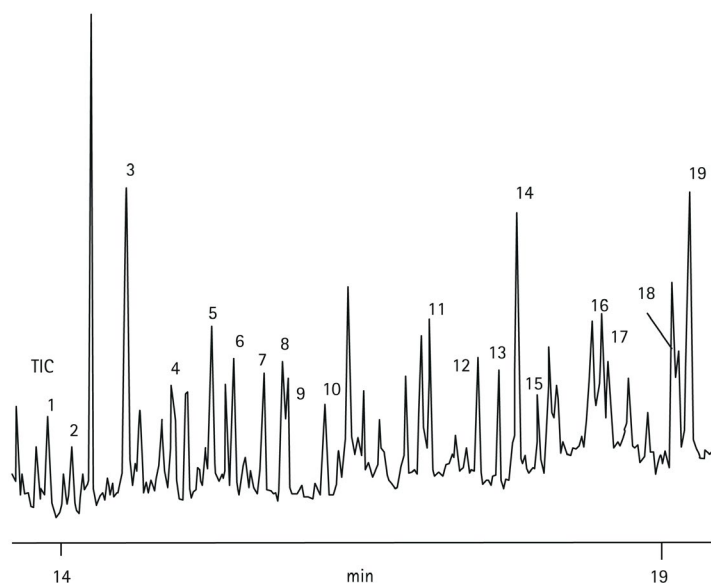
ID (mm)	Length (m)	df (µm)	Part No.
0.25	15	0.10	SC32210
0.25	30	0.10	SC32211
0.32	15	0.10	SC32213
0.32	30	0.10	SC32214
0.25	15	0.25	SC32220
0.25	15	0.50	SC32221
0.25	30	0.25	SC32223
0.25	30	0.50	SC32224
0.25	30	1.00	SC32225
0.25	60	0.25	SC32226
0.32	15	0.25	SC32230
0.32	15	1.00	SC32232
0.32	30	0.25	SC32233
0.32	30	0.50	SC32234
0.32	30	1.00	SC32235
0.32	60	0.25	SC32236
0.32	60	1.00	SC32238
0.53	15	0.50	SC32251



SCION-5MS



Pesticides in Sunflower oil

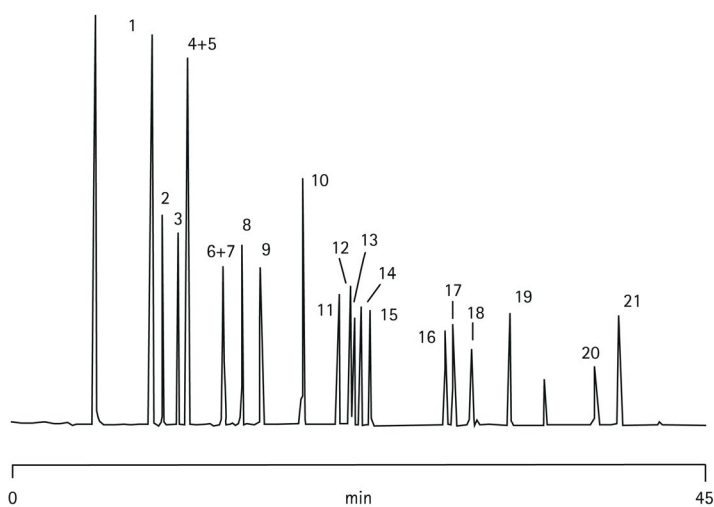


Column	SCION-5MS, 60 m x 0.25 mm, df= 0.25 µm
Sample Size	5 µL, splitless
Sample Conc	40 ppb
Carrier Gas	He, 1.2 mL/min, constant flow
Temp	70 °C (3.0 min) → 25 °C, 190 °C/min (0.0 min) → 10 °C/min → 320 °C (10 min)
Injector	1079 with carbofrit liner
Detector	MS

Peak Identification

1. b HCH	8. Ethyl parathion	
2. c HCH	9. Bromofos	15. Dieldrin
3. d HCH	10. o,p'-DDE	16. p,p'-DDD
4. + Vinclozolin	11. a Endosulfan	17. b Endosulfan
5. Pyrimiphos methyl	12. p,p'-DDE	18. p,p'-DDT
6. + Malathion	13. Ribose 2	19. Endosulfan sulfate
7. Chlorpyrifos	14. o,p'-DDD	

High resolution phenol analysis by GC/MS



Column	SCION-5MS, 0.25 mm x 30 m x 0.25 µm
Sample Conc	Approx. 5-10 ng per component on column
Carrier Gas	He, 70 kPa
Injector	Split; 1:200, T=275 °C
Detector	MS

Peak Identification

1. Phenol	12. 2,4,6-Trichlorophenol
2. 2-Chlorophenol	13. 2,4,5-Trichlorophenol
3. o-Cresol	14. 2,3,4-Trichlorophenol
4. m-Cresol	15. 2,3,6-Trichlorophenol
5. p-Cresol	16. 4-Nitrophenol
6. 2-Nitrophenol	17. 2,4-Dinitrophenol
7. 2,4-Dimethylphenol	18. 2,3,5,6 Tetrachlorophenol
8. 2,4-Dichlorophenol	19. 2-Methyl-4,6-dinitrophenol
9. 2,6-Dichlorophenol	20. Pentachlorophenol
10. 4-Chloro-3-methylphenol	21. 2-Se-butyl-4,6-dinitrophenol
11. 2,3,5-Trichlorophenol	



SCION-35MS

The Multi-purpose GC Column

- Ideal for dual column confirmational analysis for ultimate confidence
- High maximum temperature for broad applicability
- Stabilised arylene-modified equivalent of a 35% phenylmethyl
- phase for longevity

The SCION-35MS is a medium polarity column, which is the ideal choice for trace environmental and chemical analyses, and as a confirmation column. The SCION-35MS uses SCION-MS technology to produce a low bleed, highly stable column with a programmable maximum temperature of 360 °C.

Typical Applications

Aromatic compounds, pesticides and herbicides, sterols and other substituted aromatic compounds

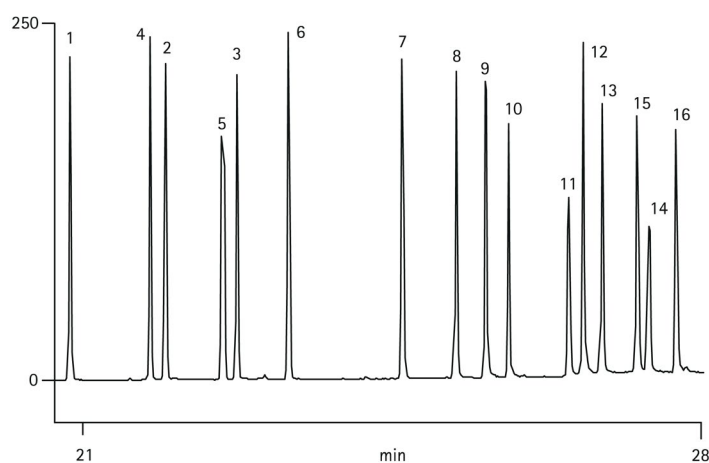
Ordering Information

SCION-35MS, Tmax-iso/Tmax-prog 340/360 °C, Tmin 40 °C

ID (mm)	Length (m)	df (µm)	Part No.
0.25	15	0.25	SC32320
0.25	30	0.25	SC32323
0.25	30	1.00	SC32325
0.25	60	0.25	SC32326
0.32	15	0.25	SC32330
0.32	30	0.25	SC32333
0.32	30	1.00	SC32335
0.32	60	0.25	SC32336
0.53	15	0.50	SC32351
0.53	30	1.00	SC32356



Organochlorin pesticides to EPA 625 via GC/MS



Column	SCION-35MS, 0.25 mm x 30 m x 0.25 µm
Carrier Gas	He, approx. 1.0 mL/min, 60 kPa
Temp	45 °C + 10 °C/min → 325 °C
Injector	Split/splitless, in split mode
Detector	MS

Peak Identification

1. α-BHC	7. Heptachlorepoxide	13. Endosulfan II
2. β-BHC	8. Endosulfan I	14. Endrin aldehyde
3. δ-BHC	9. 4,4'-DDE	15. 4,4'-DDT
4. γ-BHC (lindane)	10. Dieldrin	16. Endosulfan sulfate
5. Heptachlor	11. Endrin	
6. Aldrin	12. 4,4'-DDD	



SCION-624MS

Cyano-based for Volatiles

- Improved signal to noise ratio for more accurate trace analysis
- Eliminate ghost peaks and unstable baselines for best data accuracy
- Enhanced selectivity eliminating co-eluters such as benzene and 1,2-dichloroethane for improved productivity

The SCION-624MS is an ultra-low bleed 6% cyanopropyl/ phenyl, 94% PDMS GC column. The SCION-624MS column set a new standard for the analysis of volatile organic compounds. Improved phase technology reduces bleed, thereby increasing signal to noise ratios. These columns are especially suited for analysing solvents according to EPA Methods 524, 624 and 8260, as well as USP 467.

Typical Applications

SCION-624MS: Purgeable organic volatiles and semivolatiles, aromatics, halocarbons, solvents

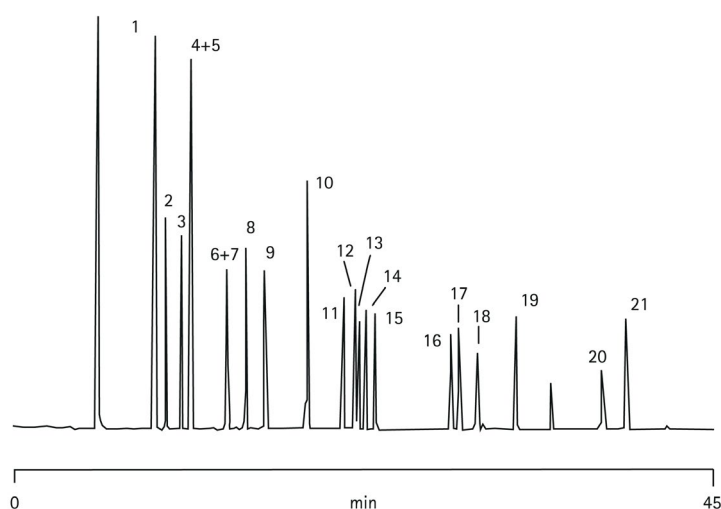
Ordering Information

SCION-624MS, Tmax-iso/Tmax-prog 280/300 °C, Tmin -40 °C

ID (mm)	Length (m)	df (μm)	Part No.
0.25	30	1.40	SC32591
0.25	60	1.40	SC32592
0.32	30	1.80	SC32594
0.32	60	1.80	SC32595
0.53	30	3.00	SC32597
0.53	60	3.00	SC32598



SCION-MS cyano columns eliminate unstable baselines



Column	SCION-624MS, 0.32 mm x 60 m x 1.8 μm
Carrier Gas	He 1 mL/min
Temp	Trap 150 °C, Manifold 40 °C, Transfer line 185 °C
Injector	Split 1:100, Injection temp 250 °C
Detector	MS

Peak Identification

8. 1,1-Dichloroethane	12. 1,1,1-Trichloroethane
9. 1,2-Dichloroethylene (cis)	13. 1,1-Dichloro-1-propylene
10. Bromochloromethane	14. Benzene
11. Chloroform	15. 1,2-Dichloroethane



SCION-WAXMS

For Very Polar Compounds

- Specially designed for MS for more accurate results with polar compounds
- Operating temperature range of 20 to 250 °C for maximum flexibility
- Better signal to noise ratio for trace analyses improves productivity

The SCION-WAXMS is a high performance column for applications in the food, flavours and fragrances markets, and especially where trace analyses are required. These applications often require higher temperatures to analyse polar compounds, and therefore need an ultra stable wax as a stationary phase. The very low bleed of SCION-WAXMS provides increased sensitivity, extended column lifetime and greater accuracy, even at higher temperatures.

Advanced coating technology means that the SCION-WAXMS columns are highly inert. Such inertness gives better chromatograms, enhancing critical pair separation. With the SCION-WAXMS column, applications such as food, fragrances and flavours can now benefit from the use of GC/MS detectors. Impurities can easily be identified using an MS detector when a wax column is required for separation. Significantly improved performance is achieved with the SCION-WAXMS columns, yet the typical selectivity of PEG is unchanged.



Tip

As a special MS-type phase, the SCION-WAXMS column generates less bleed, and therefore less noise and higher signal to noise ratios for critical components.

Ordering Information

SCION-WAXMS, Tmax-iso/Tmax-prog 250/260 °C, Tmin 20 °C

ID (mm)	Length (m)	df (µm)	Part No.
0.25	30	0.25	SC32423
0.25	30	0.50	SC32424
0.25	30	1.00	SC32425
0.25	60	0.25	SC32426
0.25	60	0.50	SC32427
0.32	15	0.25	SC32430
0.32	30	0.25	SC32433
0.32	30	0.50	SC32434
0.32	30	1.00	SC32435
0.32	60	0.25	SC32436
0.32	60	0.50	SC32437
0.32	60	1.00	SC32438
0.53	15	0.50	SC32451
0.53	30	0.50	SC32454
0.53	30	1.00	SC32455
0.53	60	0.50	SC32457
0.53	30	2.00	SC32461
0.53	60	2.00	SC32462

Typical Applications

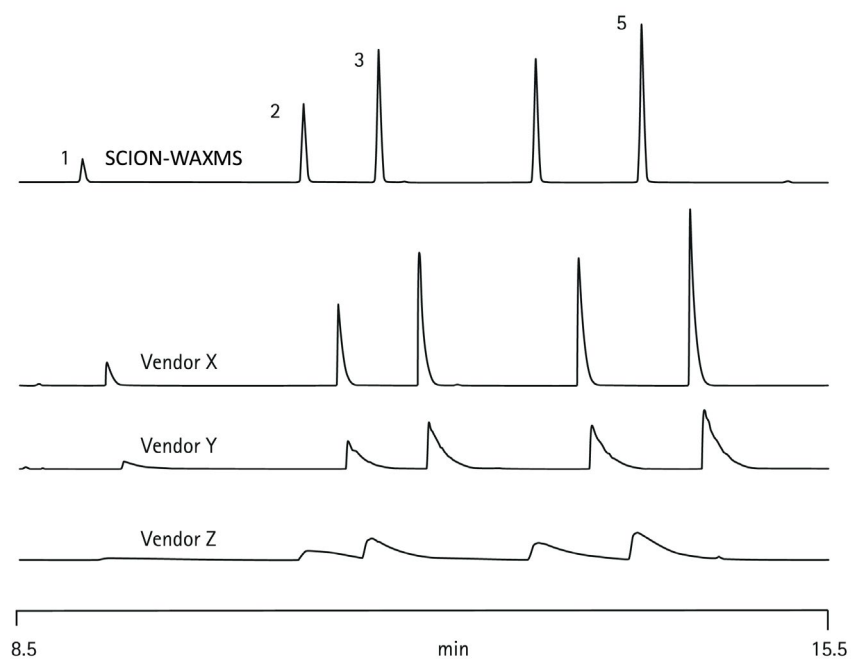
Food, beverages, flavours, FAMEs, acids, alcohols, fragrances



SCION-WAXMS



Acids



Column	SCION-WAXMS 30 m x 0.25 mm x 0.25 µm
Sample	Acid sample, 0.1% (Cyclohexane)
Sample Size	0.1 µL
Carrier Gas	Hydrogen, 75 kPa
Temp	60 °C → 200 °C, 5 °C/min 250 °C, split
Injector	100 mL/min

Peak Identification

- | | |
|---------------------|---------------------|
| 1. Acetic acid | 4. Butyric acid |
| 2. Propionic acid | 5. Iso-valeric acid |
| 3. Iso-butyric acid | |



SCION-General Purpose Columns

Applications Across the Temperature Range

- Extended column lifetimes to reduce replacement costs
- Tide application range to improve productivity

The SCION-GC columns incorporate the following phases:

- SCION-1
- SCION-5
- SCION-1701

These columns are low bleed, robust alternatives to the SCION-MS phase, delivering high quality responses for routine GC analysis, with excellent detection limits, perfect crossbonding and longer column lifetimes.

Typical Applications

Alcohols, aromatic hydrocarbons, esters, flavours and aromas, free fatty acids, glycols, halogenated hydrocarbons, hydrocarbons, ketones, organic acids, oxygenates, PAHs, pesticides, polymers, steroids, solvents, sulphur compounds, alcohols, oxygentates, PCB congeners.

Ordering Information

SCION-1701, Tmax-iso/Tmax-prog 325/350 °C, Tmin –60 °C

ID (mm)	Length (m)	df (μm)	Part No.
0.25	15	0.25	SC30320
0.25	15	0.50	SC30321
0.25	30	0.25	SC30323
0.25	30	0.50	SC30324
0.25	30	1.00	SC30325
0.25	60	0.25	SC30326
0.32	30	0.25	SC30333

Ordering Information

SCION-1, Tmax-iso/Tmax-prog 325/350 °C, Tmin –60 °C

ID (mm)	Length (m)	df (μm)	Part No.
0.32	12.5	1.20	SC30101*
0.32	3	1.20	SC30102
0.25	15	0.25	SC30120
0.25	30	0.25	SC30123
0.25	30	1.00	SC30125
0.25	60	0.25	SC30126
0.32	30	2.00	SC30141
0.32	30	5.00	SC30144
0.32	60	5.00	SC30145
0.53	30	0.50	SC30154
0.53	15	2.00	SC30160
0.53	30	2.00	SC30161
0.53	60	2.00	SC30162
0.53	30	5.00	SC30164
0.53	60	5.00	SC30165
0.53	60	0.50	SC30167

* Column is supplied on a 5" cage

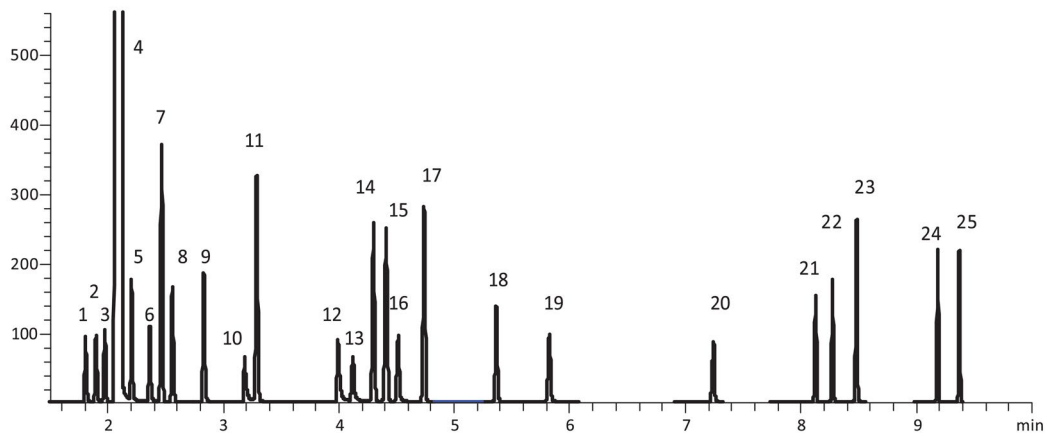
Ordering Information

SCION-5, Tmax-iso/Tmax-prog 330/350 °C, Tmin –60 °C

ID (mm)	Length (m)	df (μm)	Part No.
0.25	15	0.25	SC30220
0.25	15	0.50	SC30221
0.25	30	0.25	SC30223
0.25	30	0.50	SC30224
0.25	30	1.00	SC30225
0.25	60	0.25	SC30226
0.32	30	0.25	SC30233
0.32	60	5.00	SC30245
0.53	30	0.50	SC30254
0.53	60	0.50	SC30257
0.53	30	2.00	SC30261
0.53	30	5.00	SC30264



SCION-General Purpose Columns



Column	SCION-1701, 30 m x 0.25 mm, 0.25 µm
Injector	250 °C, split ratio 30:1
Carrier Gas	He, constant flow mode, 37 cm/s
Oven program	60 °C (2 min), 15 °C/min → 130 °C (0 min), 30 °C/min → 240 °C (1 min), 20 °C/min → 280 °C (5 min)
Detector	FID
Injection volume	1 µL

Peak Identification

1. Methanol	10. N,N-Dimethyl-2-aminoethanol	19. 1,3-Propanediol
2. Ethyl alcohol	11. Toluene	20. Diethylene glycol
3. Isopropyl alcohol	12. 2-Amino-2-methyl-1-propanol	21. 2-(2-Ethoxyethoxy)ethyl acetate
4. Acetonitrile (solvent)	13. 1,2-Ethandiol	22. 2-(2-Butoxyethoxy)ethanol
5. 1-Propanol	14. Ethylbenzene	23. 2,2,4-Trimethyl-1,3-pentanediol
6. Triethylamine	15. m,p-Xylene	24. 2-(2-Butoxyethoxy)ethyl acetate
7. Benzene	16. 1,2-Propanediol	25. Diethyl adipate (boiling point marker)
8. 2-Methyl-1-propanol	17. o-Xylene	
9. 1-Butanol	18. 2-Butoxyethanol (IS)	



SCION-PLOT Columns

The Best Choice for GC Analysis of Gases and Volatiles

SCION-PLOT GC columns give you high retention for separation of gases and volatiles, delivering the best productivity. They are also available as bonded PLOT columns for enhanced column lifetime and a broader application range.

SCION-BOND and SCION-PLOT

In Porous Layer Open Tubular (PLOT) columns the stationary phase is based on an adsorbent or porous polymer. This provides high resolution capillary gas chromatography when analysing a wide range of gases and volatiles. SCION-PLOT columns deliver superior mechanical and temperature stability and allow for increasingly fast methods.

These styrene/divinylbenzene-based columns are ideal for the analysis of solvents and volatile compounds in the chemical, petrochemical, environmental, and pharmaceutical industries. The porous polymer exhibits unique retention characteristics, including the near perfect elution of polar and non polar volatile compounds, as well as hydrocarbons, alcohols, esters, and ketones.

Polar compounds such as methanol, acetaldehyde and ethylene oxide have very short retention times in gas or liquid chromatography but do not elute from alumina or molecular sieve adsorbents. The SCION-BOND and SCION-PLOT columns elute these polar compounds as perfectly symmetrical peaks, allowing them to be analysed together with light hydrocarbons or permanent gases. Since retention is not influenced by water in the sample, retention times are repeatable.

SCION-BOND and SCION-PLOT columns have slightly different characteristics to maximise the application range.

Bonded PLOT Application Guide

PLOT Column	Typical Applications
SCION-BOND Q SCION-PLOT Q	Halogenates, hydrocarbons C1-C9, oxygenated hydrocarbons, solvents, permanent gases, alcohols, glycols, fatty acids, sulphur compounds
SCION-PLOT Q-HT	Halogenated hydrocarbons, hydrocarbons, solvents
SCION-AI2O3	Hydrocarbons C1-C5 and impurities in hydrocarbon mainstreams, benzene and toluene
SCION-Lowox	Trace level oxygenate impurities in gas and liquid hydrocarbon streams, prevention of catalyst contamination by oxygenates, process/on-line applications or portable GC applications (ASTM D 7059)



SCION-PLOT Q and SCION-PLOT Q-HT

Polar and Non-polar Volatile Compounds

- Analysis of polar and non-polar volatile compounds delivers broad applicability
- Water elutes as a sharp peak and can therefore be quantified, improving productivity
- Repeatable retention times for long-term stability that enhances efficiency

SCION-PLOT Q is recommended for column switching systems that analyse polar and apolar volatile compounds. Water elutes as a sharp and quantifiable peak. In addition, retention times are repeatable, as retention is not influenced by water in the sample. SCION-PLOT Q-HT is the high temperature version, offering the same benefits but operating up to 290 °C.

Both the SCION-PLOT Q and SCION-PLOT Q-HT series columns are fitted with one particle trap to ensure retention of PLOT material, to protect your detector against spiking and to prolong column life.

SCION-BOND Q replaces SCION-PLOT Q in over 95% of applications, offering higher column performance.

Ordering Information

SCION-PLOT Q, Tmax-iso/Tmax-prog 250/250 °C, Tmin -100 °C

ID (mm)	Length (m)	df (µm)	Part No.
0.32	25	10	SC35101
0.53	25	20	SC35102

SCION-PLOT Q, Tmax-iso/Tmax-prog 250/290 °C, Tmin -100 °C

ID (mm)	Length (m)	df (µm)	Part No.
0.53	25	20	SC35501

Typical Applications

SCION-PLOT Q

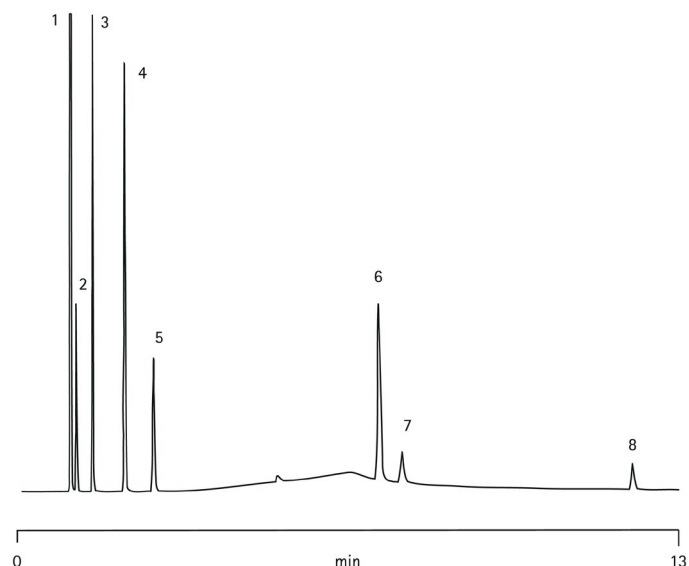
Halogenates, hydrocarbons C1-C9, oxygenated, hydrocarbons, solvents. permanent gases, alcohols, glycols, fatty acids, sulphur compounds

SCION-PLOT Q-HT

Halogenated hydrocarbons, hydrocarbons, solvents



Analysis of gases C1 to C4



Column	SCION-PLOT Q, 25 m x 0.53 mm, df= 20 µm
Sample Size	50 µL
Carrier Gas	He, 65 kPa (0.65 bar, 8 psi)
Temp	40 °C (3 min) → 150 °C, 10 °C/min
Injector	Split, 1:50, T= 225 °C
Detector	TCD, T= 250 °C

Peak Identification

- | | |
|--------------------|--------------|
| 1. Carbon monoxide | 5. Ethane |
| 2. Methane | 6. Propylene |
| 3. Carbon dioxide | 7. Propane |
| 4. Ethylene | 8. Butane |

See Also

SCION-BOND Q, analysis of halogenates and hydrocarbons, page 24



SCION-BOND Q

Analysis of Halogenates and Hydrocarbons C1-C9

- Bonded PLOT column for more reliable results
- Extended analysis of hydrocarbons for broader application range
- Increased maximum temperatures for more productivity

SCION-BOND Q is the long-term solution for analysing volatile solvents and hydrocarbons. It is the most stable column of its kind and withstands repeated water injections. Due to our manufacturing techniques, the porous polymer is very pure and has virtually no catalytic activity. This means that SCION-BOND Q can be used up to 320 °C without decomposition.

The use of bonding technology in the SCION-BOND Q also reduces the presence of loose particles that cause detector spiking or valve columns, and so there is no need for particle traps.

Ordering Information

SCION-BOND Q, Tmax-iso/Tmax-prog 300/320 °C, Tmin –100 °C

ID (mm)	Length (m)	df (µm)	Part No.
0.25	25	3	SC35601
0.32	25	5	SC35602
0.32	50	5	SC35603
0.53	25	10	SC35604

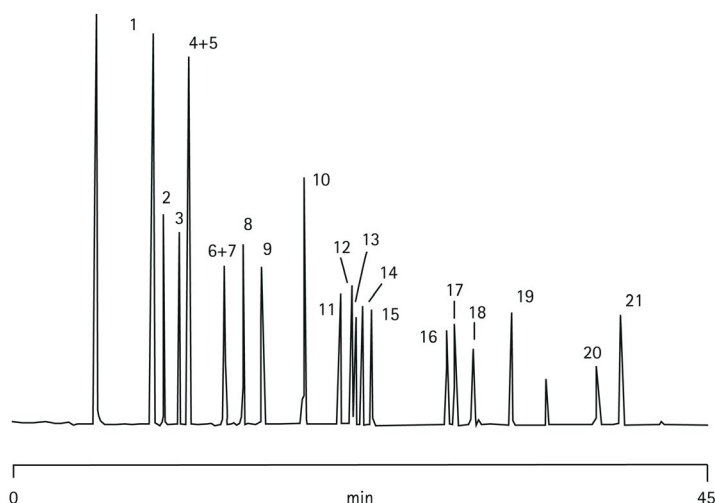
SCION-BOND Q replaces SCION-PLOT Q in more than 95% of applications, offering higher column performance.

Typical Applications

Halogenates, hydrocarbons C1-C9, oxygenated hydrocarbons, solvents, permanent gases, alcohols, glycols, fatty acids, sulphur compounds



Analysis of solvents



See Also

SCION-PLOT Q, for analysis of polar and nonpolar compounds, page 23

Column	SCION-BOND Q, 25 m x 0.53 mm, df= 10 µm
Sample Size	5 µL
Sample Conc	0.1% per compound
Carrier Gas	He, 25 kPa (0.25 bar, 3.5 psi)
Solvent	DMSO
Temp	100 °C (2 min) → 300 °C, 5 °C/min
Injector	Split, T= 250 °C
Detector	FID, T= 250 °C

Peak Identification

1. Methane	14. Tertahydrofuran
2. Methanol	15. Ethyl acetate
3. Ethanol	16. 2-Methoxyethanol
4. Acetonitrile	17. Isobutanol
5. Acetone	18. Butanol
6. Dichloromethane	19. Hexane
7. 2-Propanol	20. Benzene
8. Dimethyl sulfide	21. Trichloroethylene
9. Diethyl ether	22. Cyclohexane
10. 1-propanol	23. 1,4-Dioxane
11. Pentane	24. Pyridine
12. 2-Butanone	25. N,N-dimethylformamide
13. Trichloromethane	26. Dimethyl sulfoxide



SCION-Al₂O₃

For C₁ – C₁₀ Hydrocarbon Impurities

- A high analytical capacity improves efficiency
- No need for sub-ambient cooling simplifies operation
- Choice of two polarities for a broad range of application

Aluminum oxide PLOT columns offer high selectivity for separating ppm levels of C₁-C₁₀ hydrocarbons in C₁-C₄ hydrocarbon main streams. These columns analyse more compounds in a single run than packed columns, while still delivering higher resolution and faster analysis times. When compared to liquid stationary phases, the SCION-Al₂O₃ PLOT Column offers increased selectivity and allows all C₁-C₅ hydrocarbon isomers to be separated. SCION-Al₂O₃ operates without the need for subambient cooling and is available in two unique selectivities.

Selectivity Through KCl or Na₂SO₄ Deactivation

Aluminum oxide PLOT columns are deactivated using very small salt crystals, providing a reproducible and stable deactivation up to 200 °C. Depending on the type of deactivation salt, the SCION-Al₂O₃ PLOT Column will show a particular selectivity. The KCl salt results in a relatively apolar Al₂O₃ surface, while Na₂SO₄ deactivation provides a polar surface. Unsaturated compounds such as ethylene and acetylene (ethyne) are retained for longer.

Typical Applications

Hydrocarbons C₁-C₅ and impurities in hydrocarbon mainstreams, benzene and toluene

Ordering Information

SCION-Al₂O₃/KCl, T_{max}-iso/T_{max}-prog 200/200 °C, T_{min} -100 °C

ID (mm)	Length (m)	df (µm)	Part No.
0.32	50	5	SC35201
0.53	50	10	SC35202

Ordering Information

SCION-Al₂O₃/Na₂SO₄, T_{max}-iso/T_{max}-prog 200/200 °C, T_{min} -100 °C

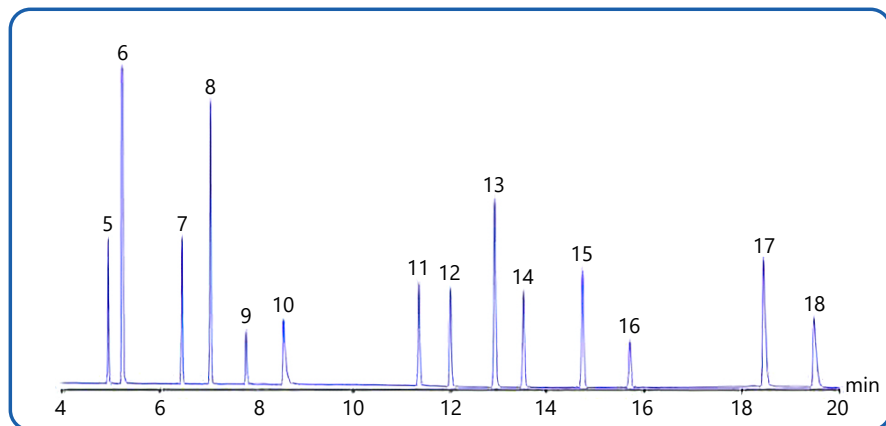
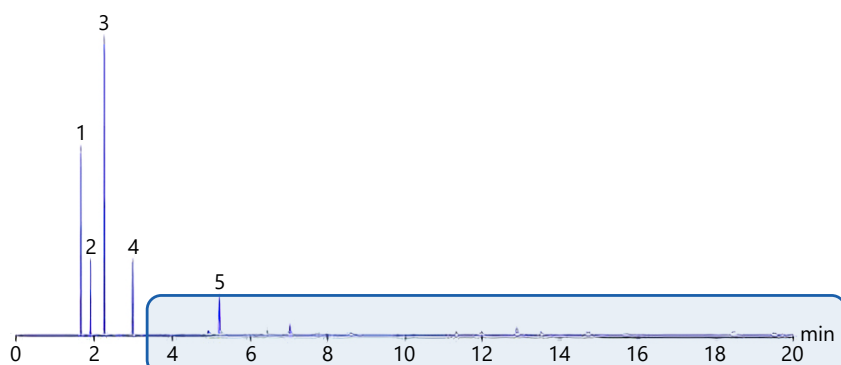
ID (mm)	Length (m)	df (µm)	Part No.
0.32	50	5	SC35301
0.53	50	10	SC35302
0.32	25	5	SC35303



SCION-AI2O3



Analysis of C1-C5 hydrocarbons



Technique	GC-FID
Column	CP-Al ₂ O ₃ /Na ₂ SO ₄ , 50 m x 0.32 mm, df= 5 µm
Temp	70 °C, 3 °C/min, 170 °C
Carrier Gas	Hydrogen, constant pressure, 100 kPa (1.0 bar, 1.4 psi)
Injector	250 °C, split 1:50
Detector	FID, 275 °C
Sample	Gas mixture
Injection Volume	5 µL

Peak Identification

1. Methane	7. Isobutane	13. Isobutene
2. Ethane	8. n-Butane	14. cis-2-Butene
3. Ethene (ethylene)	9. Propadiene	15. Isopentane
4. Propane	10. Ethyne (acetylene)	16. n-Pentane
5. Propene (propylene)	11. 1-Butene	17. Propyne (methyl acetylene)
6. Cyclopropane	12. trans-2-Butene	18. 1,3-Butadiene



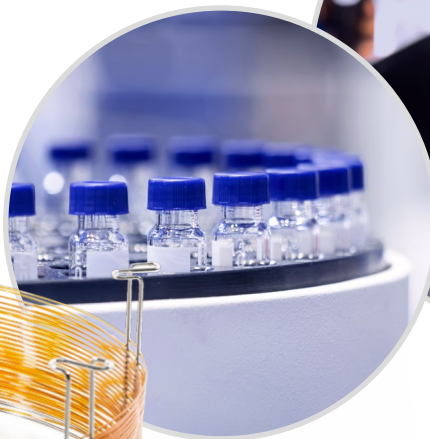
SCION-SPECIFIC GC Columns

GC Columns for SPECIFIC Applications

Our SCION-SPECIFIC application phases make it easy to optimise your choice of column. They provide excellent reproducibility that delivers consistent results for more reliable data. SCION-SPECIFIC is an ever expanding range that continues to meet new application challenges.

SCION's SPECIFIC line complements our ultra low bleed SCION-MS and PLOT columns. Our SPECIFIC columns provide separation solutions and offer guaranteed performance for specific methods and applications. All SCION-SPECIFIC columns are manufactured and tested using stringent quality assurance to ensure they meet the exact demands for their SPECIFIC application. Due to these strict specifications, column-to-column reproducibility is high, ensuring consistent results. SCION-SPECIFIC columns are designed to meet the needs of scientists working with environmental, food and fragrance, chemical, and chiral applications.

We also make custom capillary columns with the lengths and film thicknesses you need. If you have questions about one of our SCION-SPECIFIC columns, or which one to select for your application, please feel free to contact your local SCION office.





SCION-SPECIFIC GC Columns

SCION-SPECIFIC Columns for SPECIFIC Applications

Environmental Applications	SCION-SPECIFIC Column	Components & Range	Standard Method
Dioxin isomers	SCION-Dioxins	Dioxins and dibenzo furan	DIN 51277
Total petroleum hydro-carbons, mineral oil	SCION-Mineral Oil	C5-C40 hydrocarbons, total pe-troleum hydrocarbons	
Pesticides	SCION-Pesticides	PCB, detailed analysis	DIN 51527
Chiral Applications	SCION-SPECIFIC Column	Components & Range	Standard Method
Optical isomers	SCION-Chirasil-DEX	Optical isomers of acids, alcohols, amino acids, aromatic hydrocarbons, diols, flavour, aromes, ketones, organic acids and phenols	
Chemical Applications	SCION-SPECIFIC Column	Components & Range	Standard Method
Amines	SCION-Amine	C3-C20 amines, alkanol amines	
Amines	SCION-Volatile Amines	C1-C6 amines, alcohols, NH ₃ , water, solvents, ethanol amines	
Simulated distillation	SCION-SimDist	C5-C44 SimDist	ASTM D 2887
Simulated distillation	SCION-SimDist (Metal)	C5-C120 SimDist	Extended SimDist methods
Oxygenates	SCION-Loz wox	Oxygenates in C1-C10 hydro-carbons	
Food & Beverage Applications	SCION-SPECIFIC Column	Components & Range	Standard Method
FAME	SCION-FAME	FAME up to C26, cis, trans	
Mineral Oil	SCION-Mineral Oil	C5-C40 hydrocarbons	
Triglycerides	SCION-Triglycerides	Unsaturated triglycerides	



SCION-Lowox

Measurement of Oxygenated Compounds

- Unique selectivity for a wide range of oxygenates maximises flexibility
- No particle loss preserves detector performance
- Suitable for process applications
 - take the lab to the sample

SCION-Lowox offers a perfect solution to the chemical and petrochemical industries. It is now possible to analyse trace level oxygenate impurities in gas and liquid hydrocarbon streams. It is this high polarity that makes the column ideal for the measurement of oxygenated compounds. SCION-Lowox can be used for the prevention of catalyst contamination by oxygenates, process/on- line applications (ASTM D 7059).

SCION-Lowox is designed for the accurate analysis of ppm/ppb level oxygenates in C1-C10 hydrocarbons. It has extremely high polarity and column stability, with a Tmax of 350 °C, and high selectivity for a wide range of oxygenates from methanol to butyl hydroxide. SCION PLOT technology delivers very high column stability and so SCION-Lowox is ideal for valve switching and online process applications.

Ordering Information

SCION-Lowox, Tmax-iso/Tmax-prog 350/350 °C, Tmin 0 °C

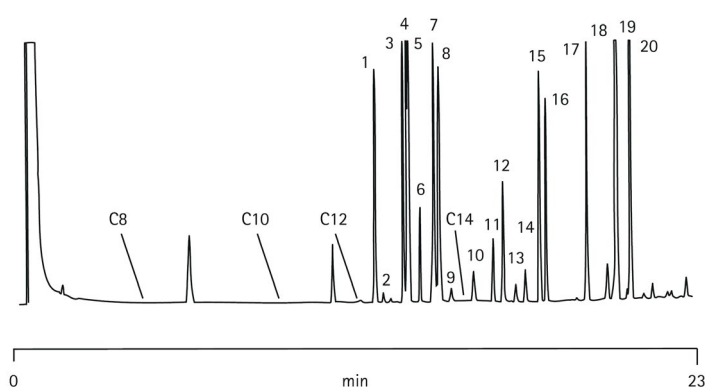
ID (mm)	Length (m)	df (µm)	Part No.
0.53	10	10	SC35401

Typical Applications

Trace level oxygenate impurities in gas and liquid hydrocarbon streams, prevention of catalyst contamination by oxygenates, process/on-line applications or portable GC applications (ASTM D 7059)



Analysis of oxygenates in a C1 to C5 hydrocarbon mix



Column	SCION-Lowox, 10 m x 0.53 mm, df= 10 µm
Sample Size	1 µL
Sample Conc	0.01% per compound
Solvent	Cyclohexane
Carrier Gas	He, 28.8 kPa (0.288 bar, 4.1 psi)
Temp	50 °C (5 min) → 240 °C, 10 °C/min
Injector	Split, T= 250 °C
Detector	FID, T= 250 °C

Peak Identification

1. Acetaldehyde	6. Propionaldehyde (propanol)	11. Methanol	16. Ethanol
2. Diethyl ether	7. Tert-amyl methyl ether	12. Acetone	17. 1-Propanol
3. Ethyl tert-butyl ether	8. Dipropyl ether	13. Isovaleraldehyde	18. 2-Methyl-1-propanol (isobutanol)
4. Methyl tert-butyl ether	9. Isobutyraldehyde	14. Valeraldehyde	19. 2-Methyl-2-propanol (tert-butanol)
5. Diisopropyl ether	10. Butyraldehyde	15. 2-Butanone	20. 1-Butanol



SCION-Mineral Oil

Optimised for Total Petroleum Hydrocarbons

- Optimised selectivity for more reliable results
- Low bleed for better accuracy

Total petroleum hydrocarbons analysis is a routine technique in many environmental laboratories, with many samples needing to be screened. A simple and reliable method is required that provides the shortest analysis time. SCION-Mineral Oil is designed to meet this need, with a stabilised non-polar bonded phase specifically for fast mineral oil analysis. The column is temperature stable up to 375/400 °C and provides speedy analyses according to DIN H53 and DIN-EN-ISO 9377-2 methods. Thanks to the temperature stability of SCION-Mineral Oil, your C4-C40 hydrocarbons can be analysed in less than ten minutes. The high temperature stability of the column permits faster bake-out. For optimal injection performance be sure to use a four meter retention gap.

Ordering Information

SCION-Mineral Oil, Tmax-iso/Tmax-prog 390/400 °C, Tmin –60 °C

ID (mm)	Length (m)	df (µm)	Part No.
0.32	15	0.1	SC37193



SCION-Triglycerides

Optimised for Unsaturated Triglycerides

- Optimised for enhanced separation
- Low bleed for better accuracy

SCION-Triglycerides provides an enhance separation depending on chain length and the level to which unsaturation is present. The chemically-bonded phase exhibits low bleed and provides longer column lifetimes.

Ordering Information

SCION-Triglycerides, Tmax-iso/Tmax-prog 350/360 °C, Tmin –60 °C

ID (mm)	Length (m)	df (µm)	Part No.
0.25	25	0.1	SC37801



SCION-Dioxins

Designed for Dioxin Isomers

- 2,3,7,8-TCDD can be determined at low concentrations for ease-of-use
- Guaranteed analysis of dioxin isomers for complete confidence in results

The SCION-Dioxin column has a very high polarity and a specific selectivity for dioxins and dibenzofuran separations. The column when used with a retention gap avoids problems with solvent condensation, thus allowing repeated splitless injections without phase deterioration, extending column life. In addition, because of the retention gap, data quality is considerably improved. To allow for the shortest analysis time, the thin-film coated columns allows applications up to 270 °C in temperature programmed mode.

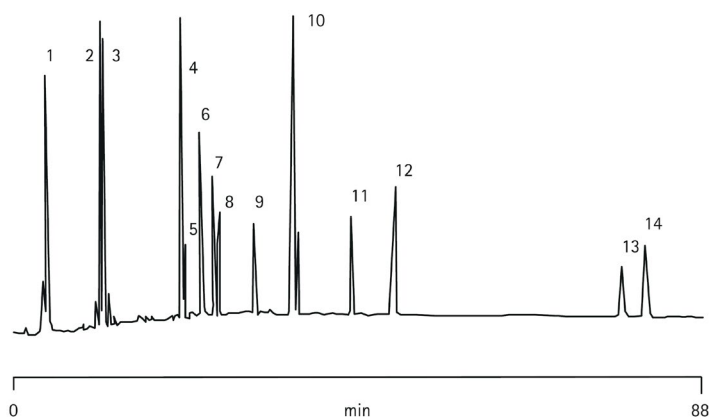
Ordering Information

SCION-Dioxins, Tmax-iso/Tmax-prog 250/270 °C

ID (mm)	Length (m)	df (μm)	Part No.
0.25	60	0.10	SC37512



Dioxins and dibenzofurans



Column	SCION-Dioxins, 60 m x 0.25 mm, df= 0.1 μm
Sample Conc.	1.0 μL Toluene, 100 - 400 pg/μL
Carrier Gas	He, 170 kPa (1.7 bar, 24 psi)
Temp	100 °C → 180 °C → 230 °C, 3 °C/min
Injector	Splitless
Detector	MS

Peak Identification

1. 2,3,7-8-TCDD	8. 1,2,3,6,7,8-PeCDF
2. 2,3,7-8-TCDF	9. 1,2,3,7,8,9-HxCDD
3. 1,2,3,7,8-PeCDF	10. 1,2,3,4,6,7,8-HxCDF
4. 1,2,3,4,7,8-HxCDF	11. 2,3,4,6,7,8-HpCDD
5. 1,2,3,6,7,8-HxCDF	12. 1,2,3,4,6,7,8-HpCDD
6. 2,3,4,7,8-PeCDF	13. 1,2,3,4,6,7,8,9-OCDF
7. 1,2,3,4,7,8-HxCDD + 1,2,3,7,8-PeCDD	14. 1,2,3,4,6,7,8,9-OCDD



SCION-Pesticides

Guaranteed for Pesticide Analysis

- Linear column response down to femtogram levels improves productivity
- Maximum inertness - tested with DDTs to provide very reliable data

SCION Pesticides can be used with on-column* injection techniques for best detection, and can deliver a linear column response to femtogram levels. The column, when used with a retention gap avoids problems with solvent condensation, thus allowing repeated splitless injections without phase deterioration.

* retention gap must be 0.53 mm ID

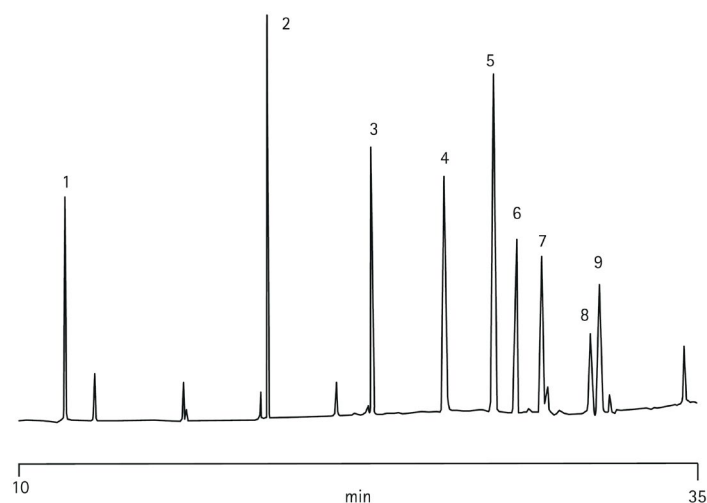
Ordering Information

SCION-Pesticides, Tmax-iso/Tmax-prog 300/325 °C

ID (mm)	Length (m)	df (μm)	Part No.
0.25	30	0.25	SC37423



Analysis of pesticides



Column	SCION-Pesticides, 30 m x 0.25 mm, df= 25 μm
Sample Size	1.0 μL
Sample Conc.	01 ppm
Solvent	Ethylacetate
Carrier Gas	He, 1.0 mL/min
Temp	60 °C, 2 min → 200 °C, 7 °C/min, 10 min → 280 °C, 20 °C/min
Injector	Splitless, splitless time 2 min
Detector	MS

Peak Identification

- | | |
|----------------------------------|---------------------|
| 1. Dichlorvos | 6. Beta HCH |
| 2. HCB | 7. Methyl-parathion |
| 3. Lindane | 8. Malathion |
| 4. Aldrin + Chloropyrphos methyl | 9. Fenitrothion |
| 5. Pirimiphos | |



SCION-SimDist and Metal

Simulated Distillation up to C100

- High temperature stationary phase for extended column lifetime
- Low bleed makes quantitation easier SCION-SimDist

Fused Silica columns are guaranteed for simulated distillation up to C100. These columns are low bleed, typically only 4-5 pA at 400 °C. The high temperature stationary phase and polyimide coating extended column lifetimes. SCION-SimDist is the most stable non-polar stationary phase based on 100% polydimethylsiloxane.

Ordering Information

SCION-SimDist, Tmax-iso/Tmax-prog 375/400 °C

ID (mm)	Length (m)	df (µm)	Part No.
0.53	5	0.09	SC37201
0.53	10	0.17	SC37202

Simulated Distillation up to C120

- High temperature stationary phase suited for all ASTM, IP, EN, DIN ISO standard Simulated Distillation test methods; from gasolines to the bottom of the barrel, including residual samples.
- Lower bleed rate than Fused Silica, best column lifetime and accurate results
- Metal tubing for extreme durability

Due to the virtually unbreakable inert metal tubing it performs extended analysis to C120, and is guaranteed to a Tmax of 450 °C. The internal diameter of Metal tubing is the same as for Fused Silica 0.53 mm ID (wide bore) columns, providing trouble-free automation of on-column injection. Retention time repeatability is better than that of any other high temperature column, due to the special deactivation applied to the metal surface.

Ordering Information

SCION-SimDist Metal, Tmax-iso/Tmax-prog 450/450 °C

ID (mm)	Length (m)	df (µm)	Part No.
0.53	5	0.17	SC37701
0.53	10	2.65	SC37788



SCION-Volatile Amines

Optimised for Volatile Amines

- Excellent stability for samples containing water expands the application range
- Maximum temperature of 265 °C for enhanced productivity
- Highly inert providing sharp amine peaks for accurate results

SCION-Volatile Amines is optimised for the separation of volatile amines. The column is coated with a non-polar stationary phase and produces symmetrical peaks due to Multi-Purpose Deactivation technology. SCION-Volatile Amines is the most stable column for analysing volatile amines even when the sample contains high percentages of water.

The SCION-Volatile Amines column is the best choice for analysing volatile amines like MMA, DMA and TMA {monomethyl, dimethylamine and trimethylamine amine). On this column other components of interest such as alcohols, water, and ammonia also elute as sharp peaks. SCION-Volatile Amines is highly inert, elutes a wide range of compounds, and delivers excellent performance and unique stability for water.

Ordering Information

SCION-Volatile Amine, Tmax-iso/Tmax-prog 265/300 °C

ID (mm)	Length (m)	Part No.
0.32	60	SC37995

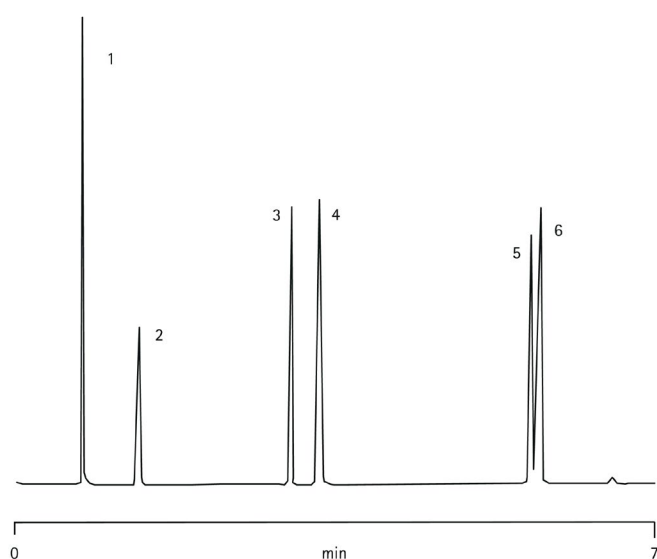


Tip

Did you know that the selectivity of polar phases changes with oven temperature, and that this can change compound elution order?



Amines and alcohols



Column	SCION-Volatile Amines Fused Silica, 60 m x 0.32 mm (film thickness: optimised)
Sample Size	0.5 µL
Sample Conc.	1000 ppm, approx. 5 ng per component on the column
Carrier Gas	He, 50 kPa, 55 cm/s
Temp	35 °C (0.5 min) → 240°, 30 °C/min
Injector	Split
Detector	MS

Peak Identification

- | | |
|-------------------------|---------------------------------|
| 1. Methanol | 4. MMEA methyl monoethanolamine |
| 2. IPA | 5. Diethanolamine |
| 3. Mono ethylene glycol | 6. MDEA methyl diethanolamine |



SCION-Amine

Optimised for a Range of Amines

- Good inertness towards basic compounds for best accuracy
- Guaranteed for the analysis of a broad range of amines for reliable results

SCION-Amines is a base-deactivated 5% phenyl polydimethylsiloxane column that can be used for a wide range of amines, particularly C3-C20 and alkanol amines. Due to a thermal stability up to 350°C, it analyses a broad range of amines up to C20, as well as alkanolamines.

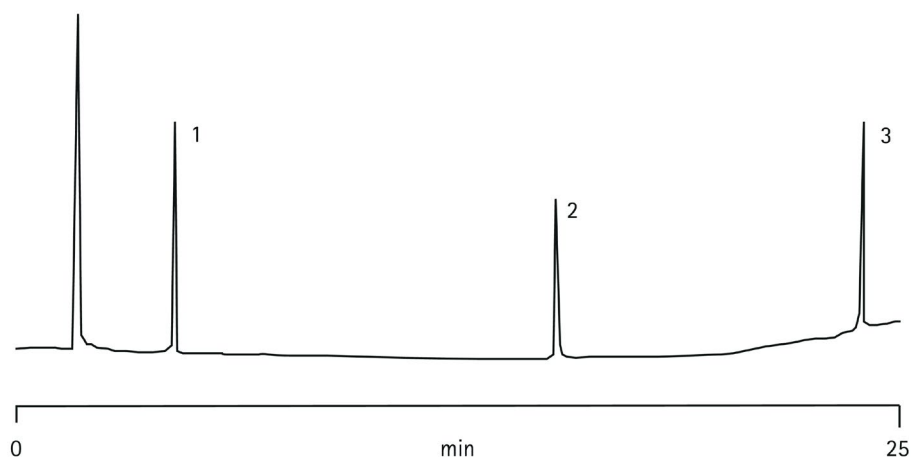
Ordering Information

SCION-Amine, Tmax-iso/Tmax-prog 325/350 °C

ID (mm)	Length (m)	df (µm)	Part No.
0.32	30	1.00	SC38035



Analysis of ethanolamines



Column	SCION-Amines, Fused Silica WCOT, 30 m x 0.32 mm, df= 1.0 µm
Sample Conc.	5-10 ng per component on the column
Solvent	Methanol
Carrier Gas	He, 50 kPa (0.5 bar, 7 psi)
Temp	60 °C (2 min) → 220 °C, 6 °C/min
Injector	Split
Detector	FID

Peak Identification

1. MEA (mono-ethanolamine)
2. DEA (di-ethanolamine)
3. TEA (tri-ethanolamine)



SCION-FAME

SCION-FAME: Optimised Selectivity for FAME

- Long life time due to high polarity 100% bonded phase
- Low bleed provides more sensitivity for better detection limits
- Better separation due to high efficiency and loadability for more accurate results

The SCION-FAME column is tuned for optimal cis/trans separations of FAMEs, especially the C18 isomers. The bonded column has an isothermal maximum operation temperature of 225 °C and a programmed temperature of 240 °C.

SCION-FAME has better detection limits because the column has a very low bleed level. Even though this is a very polar column, the column efficiency is extremely high.

The SCION-FAME column also offers three times greater loadability, further improving the shape and separation for FAME isomers - especially if one component is present at a higher concentration.

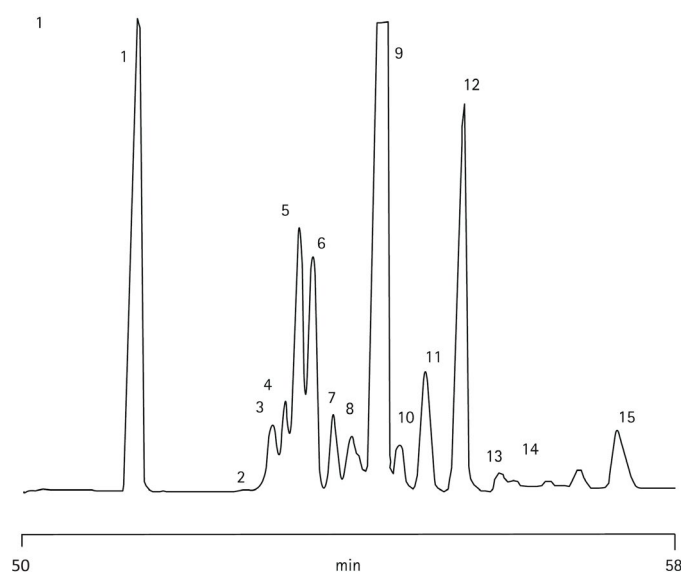
Ordering Information

SCION-FAME, Tmax-iso/Tmax-prog 225/240 °C

ID (mm)	Length (m)	df (µm)	Part No.
0.25	100	0.2	SC37301



Separation of cis/trans FAME isomers



Column	SCION-FAME, Fused Silica, 100 m x 0.25 mm (film thickness: optimised)
Sample Conc.	0.5 µL
Sample Conc.	Ca. 5 g per component on the column
Carrier Gas	He, 520 kPa
Temp	185 °C
Injector	Split
Detector	FID

Peak Identification

1. C18:0	6. C18:1 11 trans	11. C18:1 11 cls
2. C18:1 7 trans	7. C18:1 12 trans	12. C18:1 12 cls
3. C18:1 8 trans	8. C18:1 13 trans	13. C18:1 13 cls
4. C18:1 9 trans	9. C18:1 9 cls	14. C18:1 14 cls
5. C18:1 10 trans	10. C18:1 10 cls	15. C18:1 15 cls



SCION-Chirasil-Dex

SCION-Chirasil-DEX: Very High Resolution of Optical Isomers

- High resolution across a broad application range
- Chemically-bonded phase for excellent longevity
- No need for derivatisation improves productivity

The SCION-Chirasil-Dex phase consists of cyclodextrin directly bonded to dimethylpolysiloxane. This bond prevents the cyclodextrin from migrating to different locations in the surface film, delivering homogeneous enantioselectivity throughout the phase. This provides the highest resolution factor between isomers. It also guarantees stability of enantioselectivity. As a result, the lifetime of β -cyclodextrin capillary columns is significantly improved. SCION-Chirasil-Dex permits low elution temperatures of polar compounds and is suitable for all injection techniques, especially if one component is present at a higher concentration.

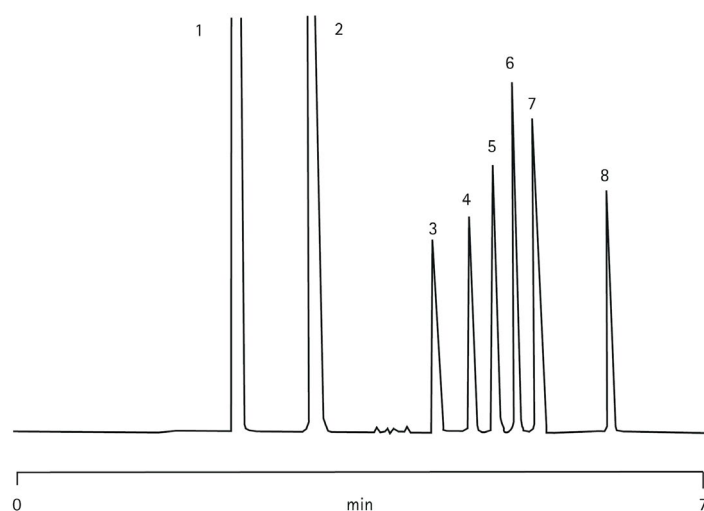
Ordering Information

SCION-Chirasil-Dex, Tmax-iso/Tmax-prog 200/200 °C

ID (mm)	Length (m)	df (μm)	Part No.
0.25	25	0.25	SC37601



High resolution separation of xylene isomers



Column	SCION-Chirasil-DEX Fused Silica, 25 m x 0.25 mm, df= 0.25 μm
Sample Size	0.5 μL
Sample Conc.	10 - 20%
Carrier Gas	He, 40 kPa, 6 psi
Temp	80 °C (6 min) \rightarrow 130 °C, 25 °C/min
Injector	Split, T= 210 °C, 1:20
Detector	FID, T= 230 °C

Peak Identification

- | | |
|----------------|------------------|
| 1. Benzene | 5. Ethyl benzene |
| 2. Toluene | 6. Ortho xylene |
| 3. Para xylene | 7. Styrene |
| 4. Meta xylene | 8. Cumene |



SCION Packed GC Columns

The following columns are used in our Custom Analyser Solutions and are also available to order as individual parts.

Molecular Sieve 5A	Part No.
10' X 1/8" Molsieve 5A column including 1/16" welded column ends	SC23946
5' X 1/8" Molsieve 5A column including 1/16" welded column ends	SC23941
1m X 1/8" X 2.0mm Inert Steel Molsieve 5A 60-80 mesh	SC15883
4m X 1/8" Inert Steel Molsieve 5A 60-80 mesh	SC18848
1.5m X 1/16" Inert Steel Molsieve 5A 80-100 mesh	SC15988
Molecular Sieve 13A	Part No.
1.5m X 1/8" Inert Steel Molsieve 13X 80-100 mesh	SC15884
1.2m X 1/16" Inert Steel Molsieve 13X 80-100 mesh	SC23945
3' X 1/8" Inert Steel Molsieve 13X 45-60 mesh	SC15923
4' X 1/8" Inert Steel Molsieve 13X 45-60 mesh	SC15919
Hayesep DB	Part No.
40' X 1/8" Hayesep DB column in 1/16" welded column ends	SC23947
10' X 1/8" Hayesep DB column including 1/16" welded column ends	SC23948
20' X 1/8" Hayesep DB column including 1/16" welded column ends	SC23949
Hayesep D	Part No.
2m X 1/8" Inert Steel Hayesep D 80-100 mesh	SC15926
Hayesep N	Part No.
0.5m X 1/8" Inert Steel Hayesep N 80-100 mesh	SC15927
6' X 1/8" Inert Steel Wall Hayesep N 80-100 mesh	SC15921
0.5m X 1/16" Inert Steel Hayesep N 80-100 mesh	SC23943
Hayesep Q	Part No.
1m X 1/8" X 2.0mm Inert Steel Hayesep Q 80-100 mesh	SC15895
0.5m X 1/8" Inert Steel Hayesep Q 80-100 mesh	SC15885
0.25m X 1/16" Inert Steel Hayesep Q 80-100 mesh	SC23944
Hayesep T	Part No.
0.5m X 1/8" Inert Steel Hayesep T 80-100 mesh	SC15894



SCION Packed GC Columns

Inert Steel Range	Part No.
15' X 1/8" Inert Steel 20% TCEP/Chrom P 80-100 mesh	SC15940
56cm X 1/16" Inert Steel 20% TCEP on Chrom P AW 80-100 mesh	SC18643
2,5' X 1/8" Inert Steel 10% SE-30 Chrom W 80-100 mesh	SC15896
2m X 1/8" Inert Steel Porapak QS 80-100 mesh	SC15925
2' X 1/8" Inert Steel 1.5% OV-101/Chrom G HP 100-120 mesh	SC15918
2' X 1/8" Inert Steel 30% DC 200/500 on Chrom P AW 60-80 mesh	SC15946
4' X 1/8" Inert Steel Molsieve 13X 45-60 mesh	SC15919
10' X 1/8" Unibeads 1S column including 1/16" welded column ends	SC12050

Delay Columns	Part No.
10' X 1/8" Inert Steel delay column	SC15922
35 FT x 1/8" METAL x 0.016 WALL	SC12069



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