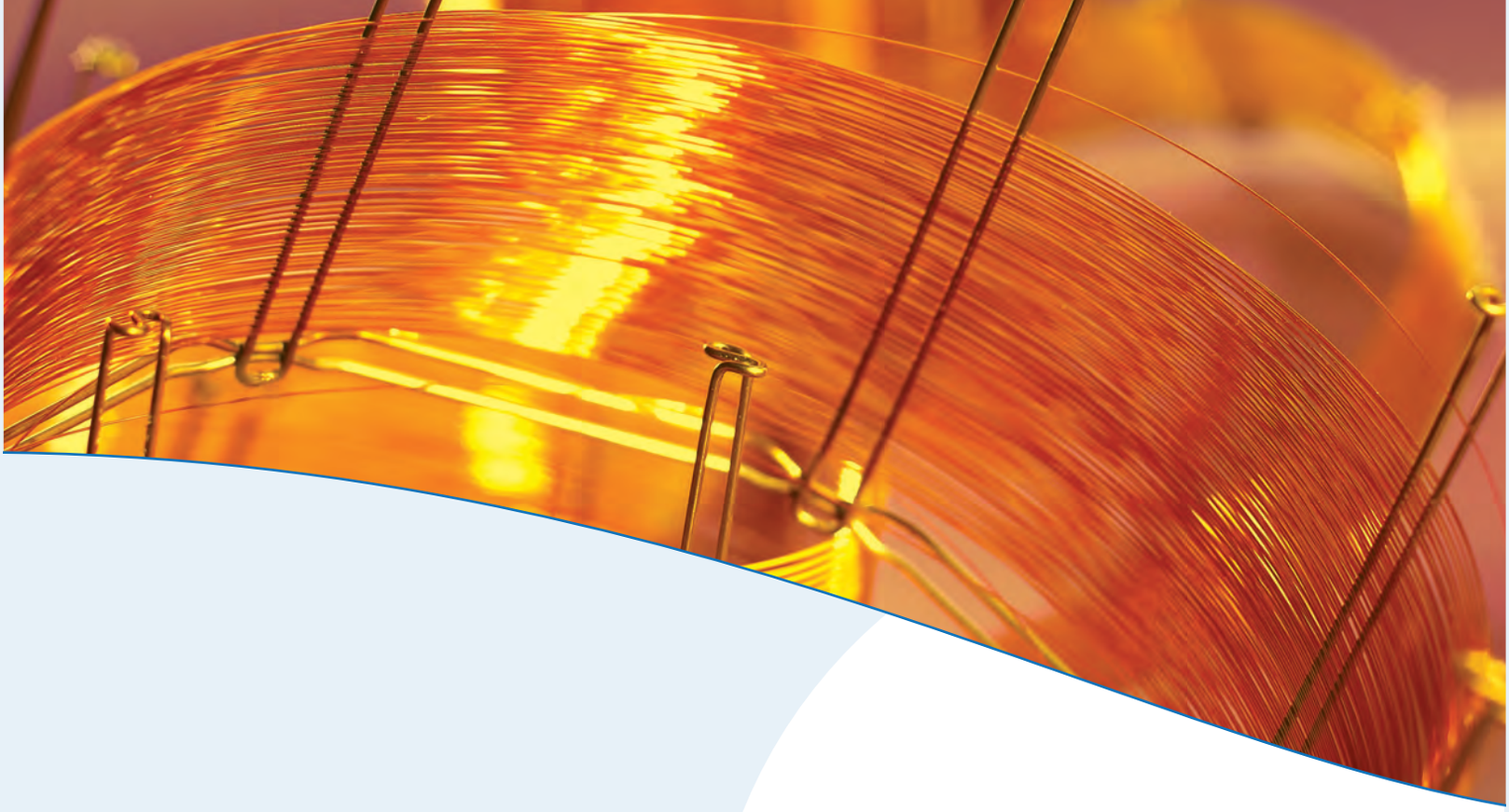
SCION INSTRUMENTS





GC COLUMN GUIDE

Powerful Gas Chromatography and Chromatography Data System Solutions



Contents

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

SCION INSTRUMENTS

GC Column Reference Guide

GC Column Reference guide by phase

SCION Column	Phase Composition/Porous Layer	Application
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-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	.2yŘŜŘ LJ2fẽăúẽ℠ŜyŜ ŘłØłyẽtõŜyÎŜyŜ LJKł·ăŜ	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 Suplhate 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 30 m x 0.25 mm df=1.4 µm SCION-624MS	SC32597 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 30 m x 0.25 mm df=1.4 µm SCION-624MS	SC32597 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 30 m x 0.32 mm df=0.25 µm SCION-1MS	SC32233 SC32135
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
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 30 m x 0.32 mm df=1.0 µm SCION-5MS	SC32597 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

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SCION Columns for EPA Methods

EPA Method: Drinking Water Continued

EPA Method	Application	SCION Capillary Column	Part No.
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

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 30 m x 0.25 mm df=1.4 µm SCION-624MS	SC32595 SC32591
602	Purgeable aromatics	30 m x 0.25 mm df=1.0 µm SCION-WAXMS 30 m x 0.25 mm df=1.4 µm SCION-624MS	SC32425 SC32591
603	Acrolein and acrylonitrile	60 m x 0.32 mm df=1.8 µm SCION-624MS 60 m x 0.25 mm df=1.4 µm SCION-624MS	SC32595 SC32592
604	Phenols	30 m x 0.25 mm df=0.25 µm SCION-5MS 60 m x 0.32 mm df=1.8 µm SCION-624MS	SC32223 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 0.53 mm df=2.0 µm SCION-5MS 30 m x 0.25 mm df=0.5 µm SCION-5MS	SC32261 SC32224
610	Polynuclear aromatic hydrocarbons	30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32223
611	Haloethers	30 m x 0.53 mm df=2.0 µm SCION-5MS 30 m x 0.25 mm df=0.5µm SCION-5MS	SC32261 SC32224
612	Chlorinated hydrocarbons	30 m x 0.25 mm df=1.0 µm SCION-5MS 30 m x 0.25 mm df=0.25 µm SCION-35MS	SC32225 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 30 m x 0.25 mm df=1.4 µm SCION-624MS	SC32595 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
8041a	Phenols by GC	30 m x 0.53 mm df=2.0 µm SCION-5MS	SC32261
8061	Phthalate esters by GC with electron capture detection (GC/ECD)	30 m x 0.53 mm df=2.0 µm SCION-5MS	SC32261
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 30 m x 0.53 mm df=0.5 µm SCION-35MS 30 m x 0.53 mm df=2.0 µm SCION-5MS	SC32225 SC32325 SC32254 SC32261
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 30 m x 0.53 mm df=0.5 µm SCION-35MS 30 m x 0.53 mm df=2.0 µm SCION-5MS	SC32225 SC32325 SC32254 SC32261
8091	Nitroaromatics and cyclic ketones by GC	30 m x 0.53 mm df=1.5 µm SCION-5MS	SC32261
8095	Explosives by GC	115 m x 0.53 mm df=2.0 µm SCION-1MS	SC32160
8100	Polynuclear aromatic hydrocarbons	30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32223
8111	Haloethers by GC	30 m x 0.53 mm df=2.0 µm SCION-5MS	SC32261
8121	Chlorinated hydrocarbons by GC: capillary column technique	30 m x 0.53 mm df=1.0 µm SCION-WAXMS 30 m x 0.53 mm df=2.0 µm SCION-5MS	SC32455 SC32261
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 pentafluorobenzylation 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	SC 37423 SC32323 SC32356 SC32225
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	SC32595 SC32598
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	SC32592 SC32223
8270d	Semi-volatile organic compounds by GC/MS	30 m x 0.25 mm df=0.1 µm SCION-5MS 30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32224 SC32111
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 30 m x 0.25 mm df=0.25 µm SCION-5MS	SC32235 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

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SCION Columns for EPA Methods

EPA Method: Solid Waste Continued

EPA Method	Application	SCION Capillary Column	Part No.
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 chromographic systems for hydrocarbon processing applications that 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 itself.

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

ASTM Method	Application	SCION Column Alternative for D3606	Part No.
D 2427	C2-C5 hydrocarbons in gasolines	50 m x 0.53 mm df=10 µm SCION-Al2O3/KCl	SC35202
D 2593	Butadiene purity and hydrocarbon impurity	50 m x 0.32 mm df=5.0 µm SCION-Al2O3/KCl 50 m x 0.53 mm df=10 µm SCION-Al2O3/KCl	SC35201 SC35202
D 2887	SimDist analysis of petroleum fractions	10 m x 0.53 mm df=2.65 µm SCION-SimDist Metal	SC37702
D 3271	Solvent analysis in paints	25 m x 0.53 mm df=20 µm SCION-PLOT Q	SC35102
D 3606	Benzene and toluene in gasoline	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 3792	Water in water-reducible paints	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 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-1MS	SC18643 SC32164
D 4322	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

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SCION-MS Columns

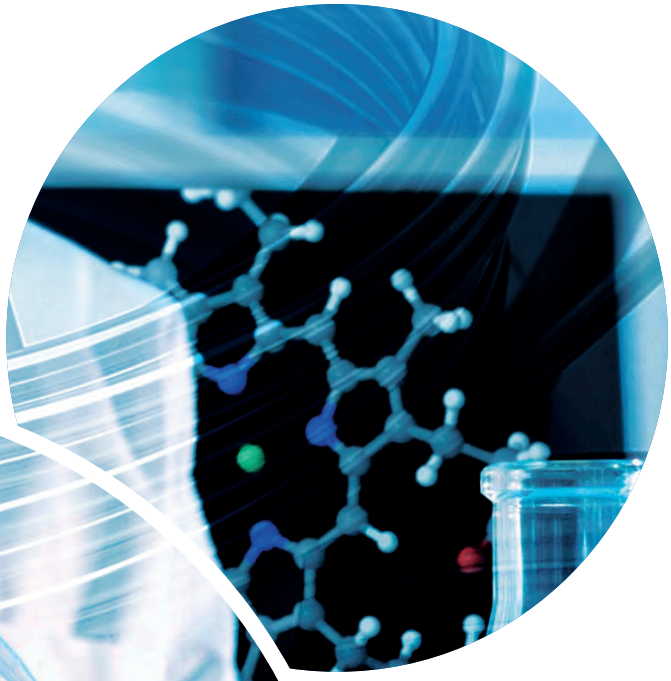
Highly Inert Capillary Columns with the Lowest Bleed

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

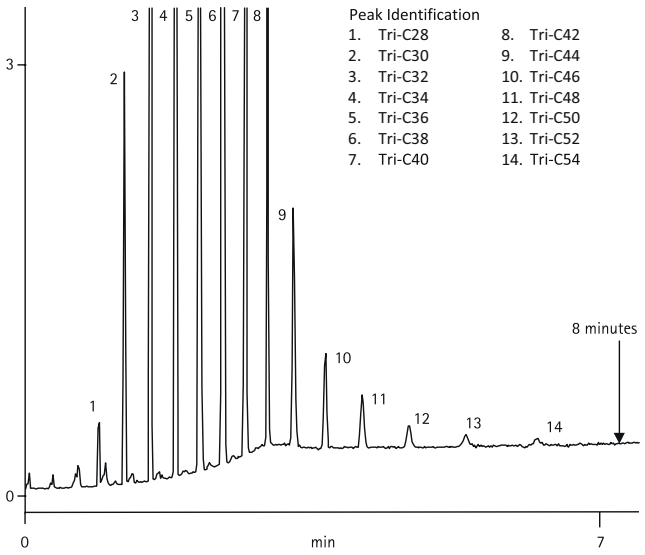
- Lowest guaranteed bleed specification for trace analysis with MS
- Wide range of applications ensures near universal applicability
- Highly inert for accurate analysis, even at trace levels

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).

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	60	0.25	SC32126
0.25	30	0.50	SC32124
0.32	15	0.25	SC32130
0.32	30	0.25	SC32133
0.32	60	0.25	SC32136
0.53	15	0.50	SC32151
0.25	30	1.00	SC32125
0.32	30	1.00	SC32135
0.32	60	1.00	SC32138
0.25	60	1.00	SC32128

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

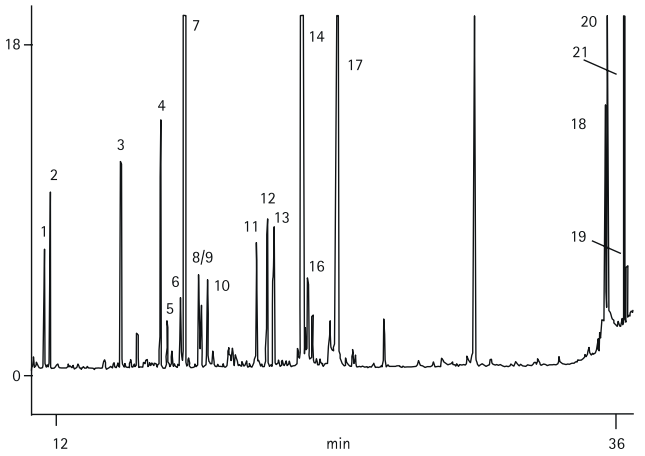
Triglycerides C28-C54



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

Separation of TMS-derivatised sugars using SCION-1MS

Peak Identification
1. Threitol
2. Erythritol
3. Rhamnose 1
4. Rhamnose 2
5. Xylose 1
6. Arabitol
7. Ribitol
8. 3-0-Methylglucose 1
9. Xylose 2
10. Rhamnitol
11. 3-0-Methylglucose 2
12. Glucuron acid-1,5-lacton
13. Ribose 2
14. Manitol
15. Sorbitol (not identified)
16. Galactitol
17. Glucuron acid
18. Lactulose
19. Lactose
20. Sucrose
21. Threhalose



Column: SCION-1MS, 30 m x 0.25 mm, df = 0.25µm
Sample Size: 5 µL, splitless 1 µL
Sample Conc: 40 ppb
Carrier Gas: He, 1.0 mL/min
Temp: 105 °C → 240 °C, 4 °C/min → 300 °C, 20 °C/min
Injector: Split; 1:15
Detector: MS

GC

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SCION-5MS

The Multi-purpose GC Column

- 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.

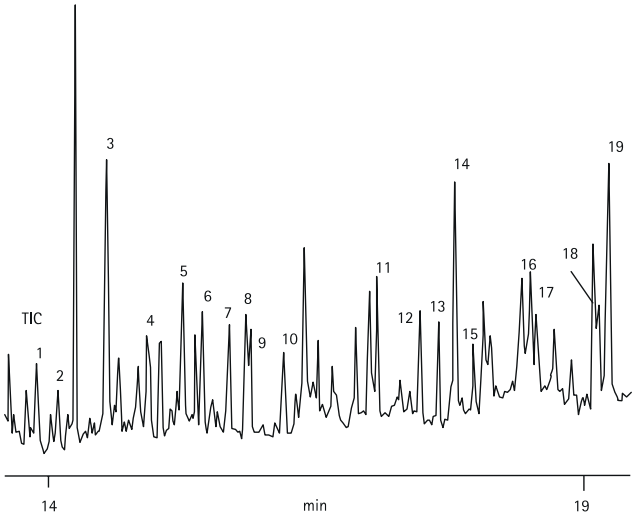
Ordering Information

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	30	0.25	SC32223
0.25	60	0.25	SC32226
0.25	15	0.50	SC32221
0.25	30	0.50	SC32224
0.32	15	0.25	SC32230
0.32	30	0.25	SC32233
0.32	30	0.50	SC32234
0.32	60	0.25	SC32236
0.53	15	0.50	SC32251
0.25	30	1.00	SC32225
0.32	15	1.00	SC32232
0.32	30	1.00	SC32235
0.32	60	1.00	SC32238

Pesticides in sunflower oil

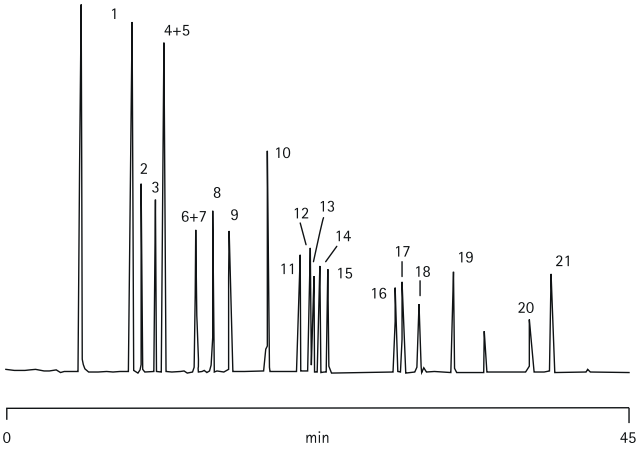
Peak Identification
1. b HCH
2. c HCH
3. d HCH
4. + Vinclozolin
5. Pyrimiphos methyl
6. + Malathion
7. Chloropyrifos
8. Ethyl parathion
9. Pyrimiphos ethyl
10. Bromofos
11. o,p'-DDE
12. a Endosulfan
13. p,p'-DDE
14. o,p'-DDD
15. Dieldrin
16. p,p'-DDD
17. b Endosulfan
18. p,p'-DDT
19. Endosulfan sulfate



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

High resolution phenol analysis by GC/MS

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



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: Helium, 70 kPa
Injector: Split, 1:200, T=275 °C
Detector: MS

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

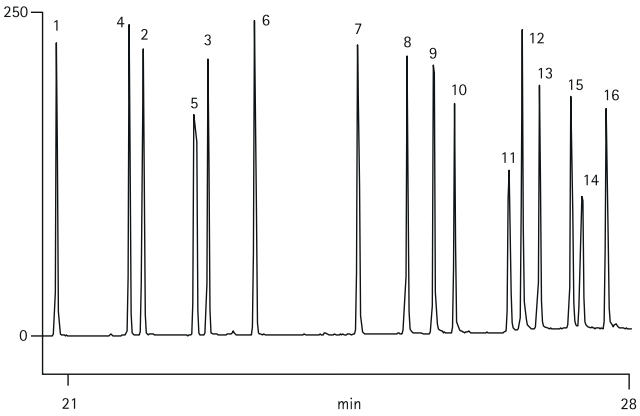
The SCION-35MS is a medium polarity column, which is the ideal choice for trace environmental and chemical analyses, and as a confirmation column. The SCION-35MS uses SCION-MS technology to produce a low bleed, highly stable column with a programmable maximum temperature of 360 °C.

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

Organochlorine pesticides to EPA 625 via GC/MS

Peak Identification

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



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

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	60	0.25	SC32326
0.32	15	0.25	SC32330
0.32	30	0.25	SC32333
0.32	60	0.25	SC32336
0.53	15	0.50	SC32351
0.25	30	1.00	SC32325
0.32	30	1.00	SC32335
0.53	30	1.00	SC32356

SCION-624MS

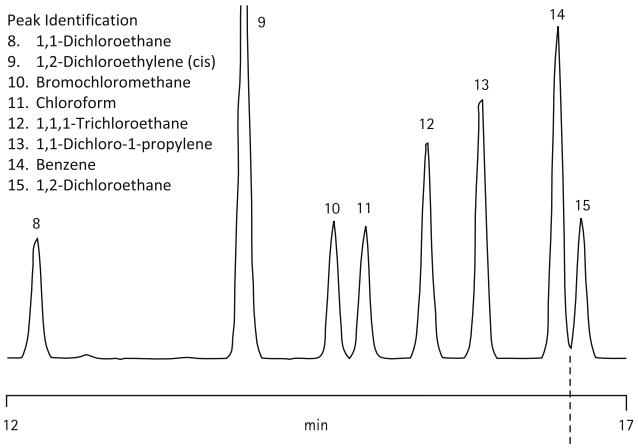
Cyano-based for Volatiles

- 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

SCION-MS cyano columns eliminate unstable baselines



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

Ordering Information

SCION-624MS, Tmax-iso/Tmax-prog 250/300 °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-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.

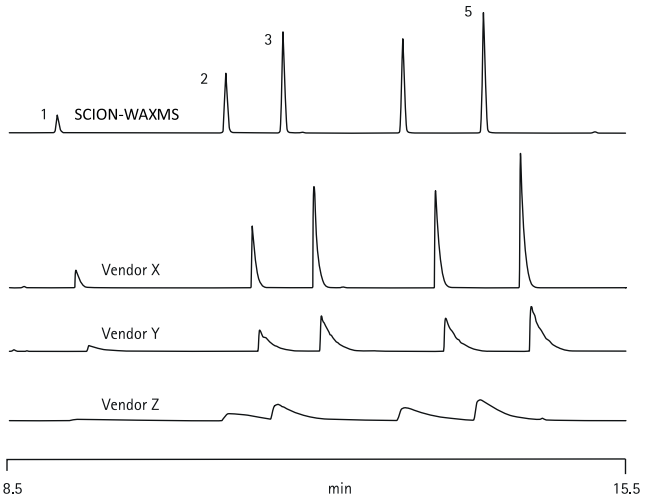
Advanced coating technology means that the SCION-WAXMS columns are highly inert. Such inertness gives better chromatograms, enhancing critical pair separation. With the SCION-WAXMS column, applications such as food, fragrances and flavours can now benefit from the use of GC/MS detectors. Impurities can 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.

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

Acids

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



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

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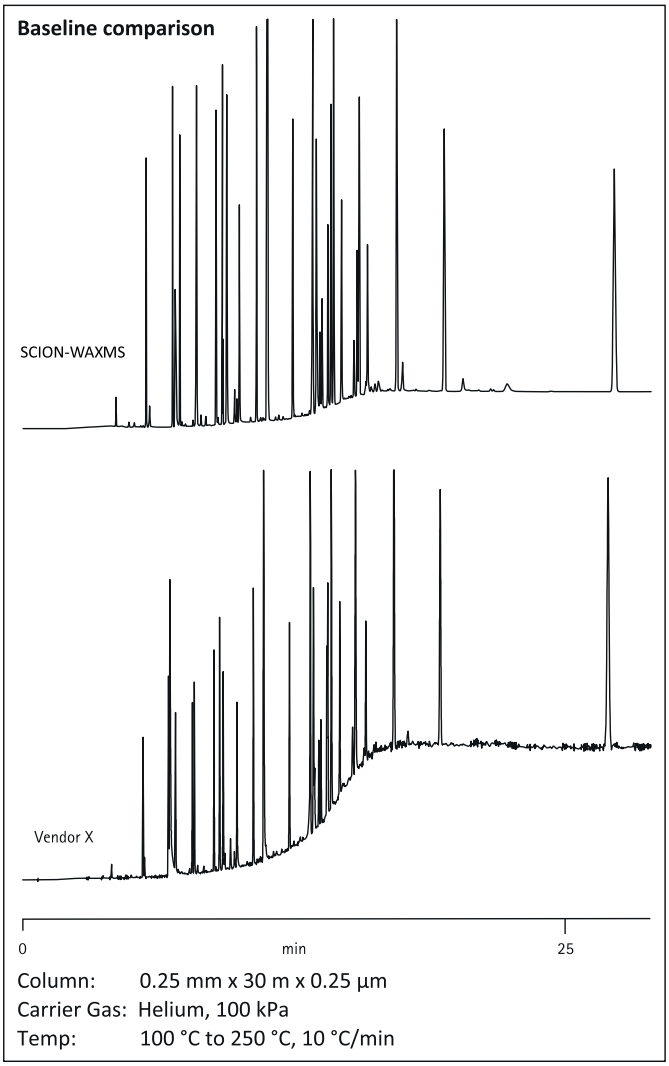
SCION-WAXMS



Column: 0.25 mm x 30 m x 0.25 µm
Carrier Gas: Helium, 100 kPa
Temp: 100 °C to 250 °C, 10 °C/min

Ordering Information

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

ID (mm)	Length (m)	df (µm)	Part No.
0.25	15	0.25	SC32420
0.25	30	0.25	SC32423
0.25	60	0.25	SC32426
0.25	30	0.50	SC32424
0.25	60	0.50	SC32427
0.32	15	0.25	SC32430
0.32	30	0.25	SC32433
0.32	60	0.25	SC32436
0.32	30	0.50	SC32434
0.32	60	0.50	SC32437
0.53	15	0.50	SC32451
0.53	30	0.50	SC32454
0.53	60	0.50	SC32457
0.25	30	1.00	SC32425
0.32	30	1.00	SC32435
0.32	60	1.00	SC32438
0.53	30	1.00	SC32455
0.53	30	2.00	SC32461
0.53	60	2.00	SC32462

SCION-General Purpose Columns

Applications Across the Temperature Range

- Extended column lifetimes to reduce replacement costs
- Wide 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-5, Tmax-iso/Tmax-prog 325/350 °C, Tmin –60 °C

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

Ordering Information

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

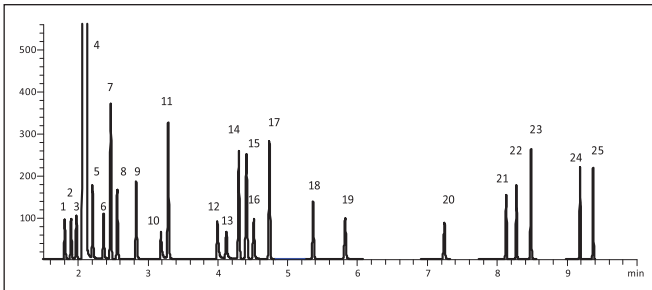
ID (mm)	Length (m)	df (µm)	Part No.
0.25	15	0.25	SC30120
0.25	30	0.25	SC30123
0.25	60	0.25	SC30126
0.25	30	1.00	SC30125
0.32	60	5.00	SC30145
0.32	12.5	1.20	SC30101*
0.32	3	1.20	SC30102
0.53	15	2.00	SC30160
0.32	30	2.00	SC30141
0.53	30	2.00	SC30161
0.53	60	2.00	SC30162
0.32	30	5.00	SC30144
0.32	60	5.00	SC30145
0.53	30	0.50	SC30154
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-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	30	0.25	SC30323
0.25	60	0.25	SC30326
0.25	15	0.50	SC30321
0.25	30	0.50	SC30324
0.32	30	0.25	SC30333
0.25	30	1.00	SC30325



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

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

GC

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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.

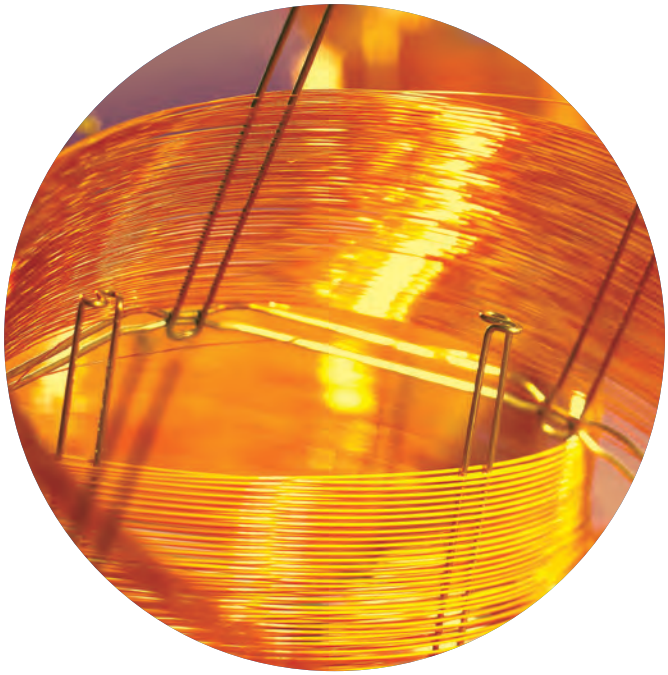
SCION-BOND and SCION-PLOT

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 analszing 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-Al2O3	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-HT, Tmax-iso/Tmax-prog 290/290 °C, Tmin -100 °C

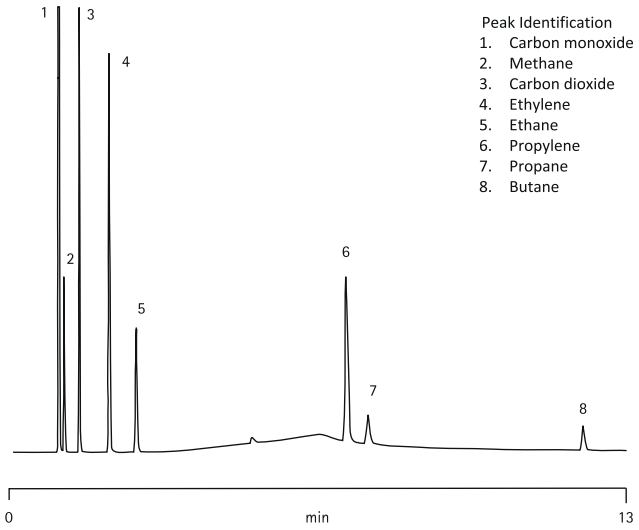
ID (mm)	Length (m)	df (µm)	Part No.
0.53	25	20	SC35501

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) to 150 °C, 10 °C/min
Injector: Split, 1:50, T=225 °C
Detector: TCD, T=250 °C

See Also

- SCION-BOND Q, analysis of halogenates and hydrocarbons, page 19

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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.

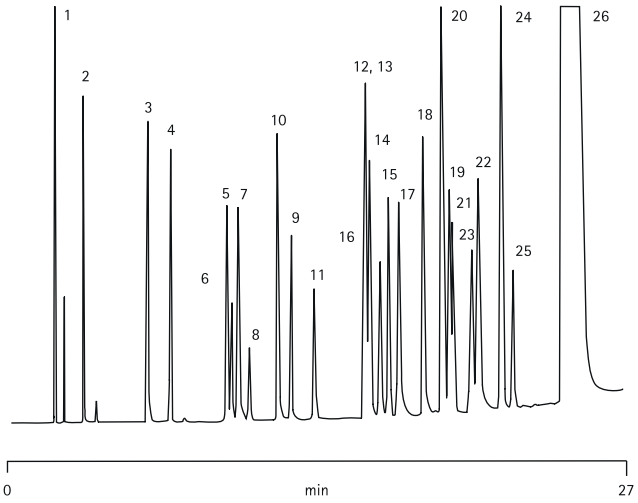
Typical Applications

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

Analysis of solvents

Peak Identification

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



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) to 300 °C, 5 °C/min
Injector: Split, T=250 °C
Detector: FID, T=250 °C

See Also

- SCION-PLOT Q, for analysis of polar and nonpolar compounds, page 18

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 applications

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-Al203 PLOT Column offers increased selectivity and allows all Cl-C5 hydrocarbon isomers to be separated. SCION-Al2O3 operates without the need for subambient cooling and is available in two unique selectivities.

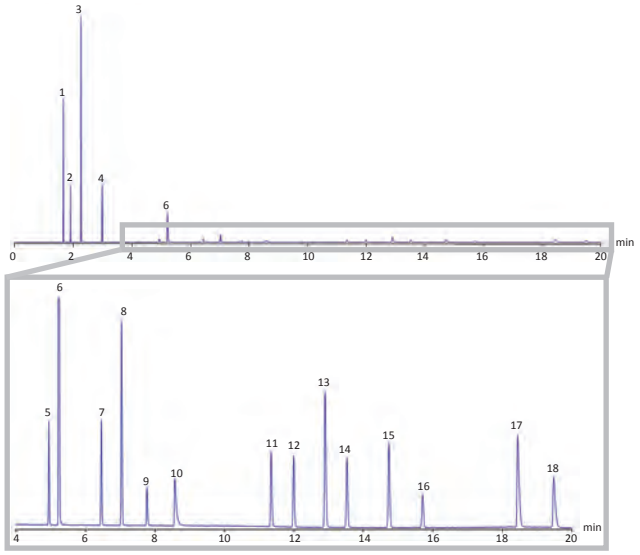
Selectivity Through KCl or Na_2SO_4 Deactivation
Aluminum oxide PLOT columns are deactivated using very small salt crystals, providing a reproducible and stable deactivation up to 200 °C. Depending on the type of deactivation salt, the SCION-Al203 PLOT Column will show a particular selectivity. The KCl 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

Analysis of C1-C5 hydrocarbons

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
6 Propene (propylene)	12 1-Butene	18 Propyne (methyl acetylene)
5 Cyclopropane	11 trans -2-Butene	17 1,3-Butadiene



Technique:	GC-FID
Column:	CP-Al_2O_3/Na_2SO_4, 50 m x 0.32 mm, df=5 µm
Temperature:	70 °C, 3 °C/min, 170 °C
Carrier Gas:	Hydrogen, constant pressure, 100 kPa (1.0 bar, 14.5 psi)
Injection:	250 °C, split 1:50
Detection:	FID, 275 °C
Sample:	Gas mixture
Injection Volume:	5 µL

Ordering Information

SCION-Al2O3/KCl, Tmax-iso/Tmax-prog 200/200 °C, Tmin –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, Tmax-iso/Tmax-prog 200/200 °C, Tmin –100 °C

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

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 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 hydrocarbons, mineral oil	SCION-Mineral Oil	C5-C40 hydrocarbons, total petroleum hydrocarbons	
Pesticides	SCION-Pesticides	PCB, detailed analysis	DIN 51527

Chiral Applications	SCION-SPECIFIC Column	Components & Range
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, NH3, 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-Lowox	Oxygenates in C1-C10 hydrocarbons	

Food & Beverage Applications	SCION-SPECIFIC Column	Components & Range
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

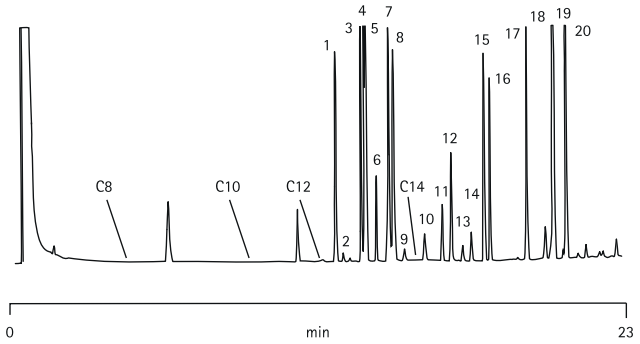
Typical Applications

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

Peak Identification

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



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) to 240 °C, 10 °C/min
Injector:	Split, T - 250 °C
Detector:	FID, T=250 °C

GC

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 then 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)	Quantity/ pk	Part No.
0.32	15	0.1	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)	Quantity/ pk	Part No.
0.25	25	0.1	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.

Dioxins and dibenzofurans

Peak Identification

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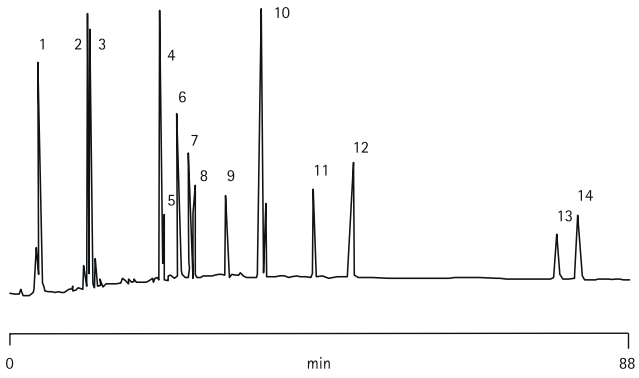
14. 1,2,3,4,6,7,8,9-OCDD



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

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

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

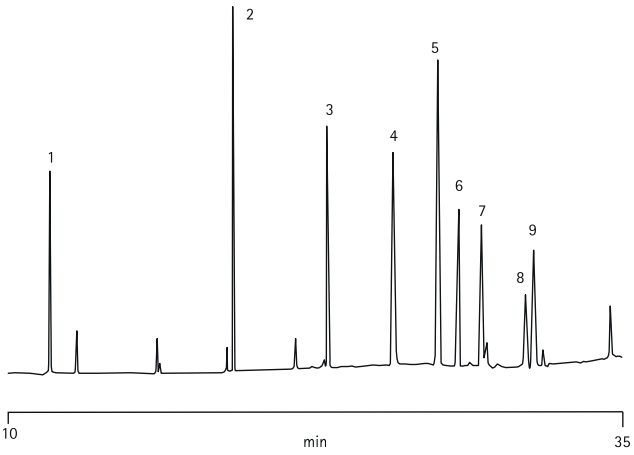
SCION Pesticides can be used with on-column* injection techniques for best detection, and can deliver a linear column response to femtogram levels. The column, when used with a retention gap avoids problems with solvent condensation, thus allowing repeated splitless injections without phase deterioration.

* retention gap must be 0.53 mm ID

Analysis of pesticides

Peak Identification

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



Column:	SCION-Pesticides 30 m x 0.25 mm, df = 0.25 µm
Sample Size:	1.0 µL
Sample Conc:	1 ppm
Solvent:	Ethylacetate
Carrier Gas:	Helium, 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

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

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 extend column lifetimes. SCION-SimDist is the most stable non-polar stationary phase based on 100% polydimethylsiloxane.

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, 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

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	SC37702

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.

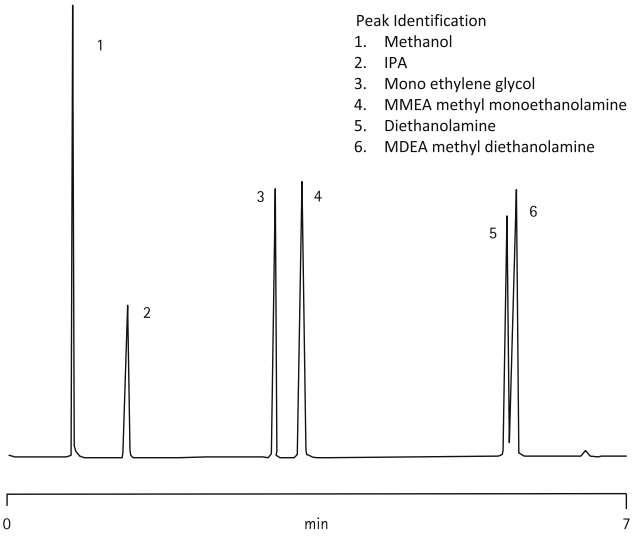
Tip
Did you know that the selectivity of polar phases changes with oven temperature, and that this can change compound elution order?

Ordering Information

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

Length(m)	ID	Part No.
60	0.32	SC37995

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
Solvent:	Methanol
Carrier Gas:	Helium, 50 pKa, 55 cm/s
Temp:	35 °C (0.5 min) → 240 °C, 30 °C/min
Injector:	Split
Detector:	MS

GC

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

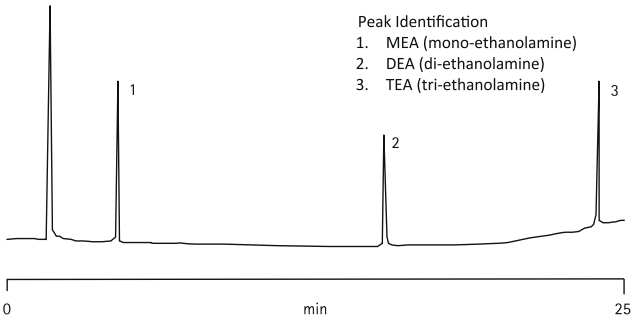
SCION-Amines is a base-deactivated 5% phenyl polydimethylsiloxane column that can be used for a wide range of amines, particularly C3-C20 and alkanol amines. Due to a thermal stability up to 350°C, it analyses a broad range of amines up to C20, as well as alkanolamines.

Ordering Information

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

ID (mm)	Length (m)	df (µm)	Part No.
0.3	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:	60 °C (5 min) → 220 °C, 6 °C/min
Temp:	Helium, 50 kPa (0.5 bar, 7 psi)
Injector:	Split
Detector:	FID

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 275 °C and a programmed temperature of 290 °C - a dramatic improvement of 50 °C compared to non-bonded columns.

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

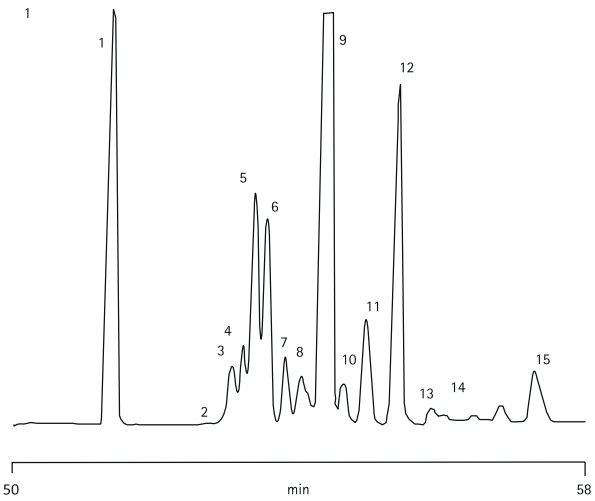
SCION-FAME, Tmax-iso/Tmax-prog 275/290 °C

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

Separation of cis/trans FAME isomers

Peak Identification

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



Column:	SCION-FAME, Fused Silica, 100 m x 0.25 mm (film thickness: optimised)
Sample Size:	0.5 µL
Sample Conc:	Ca. 5 g per component on the column
Carrier Gas:	Helium, 520 kPa
Temp:	185 °C
Injector:	Split, 1:20
Detector:	FID

GC

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

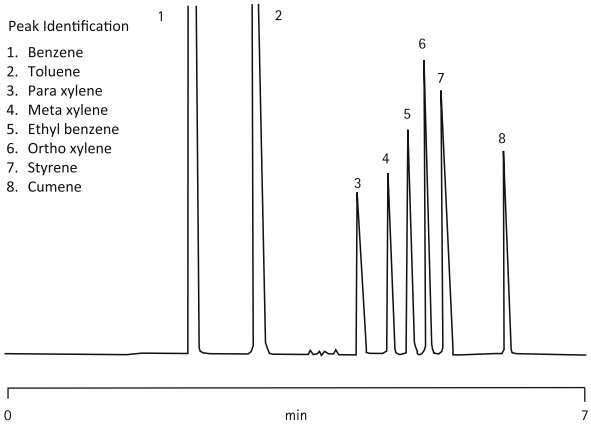
SCION-Chirasil-Dex, Tmax-iso/Tmax-prog 200/200 °C

ID (mm)	Length (m)	df (µm)	Part No.
0.25	25	0.25	SC37301

High resolution separation of xylene isomers

Peak Identification

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



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:	Helium, 40 kPA, 6 psi
Temp:	80 °C, (6 min) → 130 °C, 25 °C/min
Injector:	Split, T = 210 °C, 1:20
Detector:	FID, T=230 °C

SCION Packed GC Columns

The following columns are used in our Custom Analyser Soultions 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
1.5m X 1/16" Inert Steel Molsieve 5A 80-100 mesh	SC23942
4m X 1/8" Inert Steel Molsieve 5A 60-80 mesh	SC18848

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
1.5m X 1/16" Inert Steel Hayesep Q 80-100 mesh	SC15988
0.25m X 1/16" Inert Steel Hayesep Q 80-100 mesh	SC23944

Hayesep P	
6' X 1/8" Inert Steel Hayesep P 80-100 mesh	SC15920

Hayesep R	Part No.
2.6m X 1/8" X 2mm Inert Steel Hayesep R 80-100 mesh	SC15892
1m X 1/8" X 2mm Inert Steel Hayesep R 80-100 mesh	SC15886
12' X 1/8" Inert Steel Hayesep R 80-100 mesh	SC15924

Hayesep T	Part No.
0.5m X 1/8" Inert Steel Hayesep T 80-100 mesh	SC15894

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
30' X 1/8" Inert Steel 30% DC200/500 on Chrom P AW 60-80 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

SCION Instruments

GAS Chomatography Solutions

Built on the history of Chrompack and Varian in GC and GC-MS, SCION Instruments was acquired by the Techcomp group in 2014. SCION Instruments designs, develops, supplies and supports GC, GC-MS and Compass CDS (chromatography data system) product lines.

The company prides itself for manufacturing in Europe at facilities in Goes, The Netherlands with its headquarters based in Livingston, Scotland. SCION Instruments maintains a global infrastructure to support sales around the world. Service and support is also available for users of legacy Varian systems.

Our Mission

Delivering excellence in products, services and innovations to the industrial, academic and environmental applied markets.

Research and Development

SCION Instruments is committed to continuing the 50+ year legacy of product and service innovation.

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