

Metal (MXT[®]) Columns

Top: Trisha Houser, Quality Assurance Analyst

Middle: Leah Holmes, Customer Service Representative

Bottom: Ben Smith, Innovations Intern



What is an MXT® column?

MXT® columns are made from stainless steel tubing that has had the internal surface treated with our exclusive Silcosteel® surface treatment. The Silcosteel® layer makes the surface as inert as deactivated fused silica. The unique Silcosteel® process enables us to offer MXT® columns in a wide range of internal diameters, including 0.18mm, 0.25mm, 0.32mm, and 0.53mm. Because the Silcosteel® layer permeates the stainless steel surface, rather than simply coating it, the layer is exceptionally flexible, so the tubing can be coiled to very small diameters: the coil diameter for 0.53mm ID columns is 2.5 inches, and the coil diameter for 0.25mm ID columns is 1.5 inches.

The unique properties of the Silcosteel® treated surface enable us to treat the tubing with a wide variety of polymer phases. The many choices of MXT® columns include:

- | | | | |
|---------------------|-------------|------------------|----------------|
| • MXT®-1 | • MXT®-35 | • MXT®-1701 | • MXT®-624 |
| • MXT®-5 | • MXT®-50 | • MXT®-200 | • MXT®-BAC1 |
| • MXT®-1HT Sim Dist | • MXT®-65 | • MXT®-WAX | • MXT®-BAC2 |
| • MXT®-2887 | • MXT®-65TG | • MXT®-502.2 | • Guard tubing |
| • MXT®-20 | • MXT®-1301 | • MXT®-Volatiles | |

Compare MXT® columns and fused silica columns:

- Metal tubing allows MXT® columns to be used to higher temperatures (430°C) than fused silica columns (standard rating is 360°C). This is because the polyimide resin that encases the fused silica becomes brittle over time at high temperatures. MXT® columns do not become brittle over time.
- Inertness of MXT® columns and fused silica columns is similar, due to the unique properties of the Silcosteel® surface treatment in MXT® columns.
- Coating efficiency (plates/meter) of MXT® columns is slightly less than that of fused silica, due to a rougher surface in the metal tubing.
- MXT® columns will not break under stress, and they can be coiled to small diameters.

MXT® columns are your best choice for:

- Situations in which the potential for column breakage is high:
 - field instruments
 - process GC
 - GCs with small ovens, such as portable instruments, requiring tightly coiled columns.
- High temperature chromatography. Silcosteel® deactivated stainless steel tubing can withstand temperatures exceeding 430°C; the only limitation to oven temperature is the polymer itself.



did you know?

MXT® columns are ideal for high-temperature gas chromatography.

MXT® and Hydroguard™ Guard Columns

Intermediate-Polarity Deactivated Guard Columns/Transfer Lines

- Useful for a wide range of applications.
- Use with most common solvents.
- Maximum temperature: 325°C

Intermediate-Polarity Deactivated MXT® Guard Columns/Transfer Lines

(passivated stainless steel)

Nominal ID	Nominal OD	5-Meter	5-Meter/6-pk.	10-Meter
0.28mm	0.53 ± 0.025mm	70044	70044-600	70046
0.53mm	0.74 ± 0.025mm	70045	70045-600	70047

Hydroguard™-Treated Guard Columns & Transfer Lines

- Extend analytical column lifetime by preventing degradation by harsh “steam-cleaning” water injections.
- Maximum temperature: 325°C.

When transfer lines from purge & trap systems, air monitoring equipment, or other instruments carry condensed water vapor, deactivated column tubing quickly becomes active because of the creation of free silanol groups. These silanol groups adsorb active oxygenated compounds such as alcohols and diols.

Restek chemists have addressed this concern and found a solution—the Hydroguard™ deactivation process. A unique deactivation chemistry creates a high-density surface that is not readily attacked by aggressive hydrolysis. The high-density surface coverage of the Hydroguard™ deactivation layer effectively prevents water vapor from reaching the fused silica surface beneath. Use Hydroguard™ tubing for connecting GCs to:

- Purge & trap systems.
- Headspace analyzers.
- Air analysis equipment and concentrator units.

Hydroguard™ Treated MXT® Guard Columns & Transfer Lines (passivated stainless steel)

Nominal ID	Nominal OD	5-Meter	10-Meter	30-Meter**	60-Meter**†
0.28mm	0.53 ± 0.025mm	70080	70083	70086	70089
0.53mm	0.74 ± 0.025mm	70081	70084	70087	70090

**30- and 60-meter lengths are banded in 5-meter sections.

†Recommendation: Cut 60m guard columns into shorter lengths. Using full length may cause peak distortion.

a plus 1 story

“Since now almost 15 years, the Laboratoire Interuniversitaire des Systèmes Atmosphériques (LISA) of the University of Paris XII has been developing GC subsystems for on-board space probe GCMS experiments dedicated to the *in situ* analysis of extraterrestrial environments. Most of the capillary columns used in these subsystems were and still are provided by the Restek company.

One capillary column, MXT-1701¹, was aboard the Huygens probe of the Cassini-Huygens mission which explored successfully in 2005 the atmosphere of Titan, the largest moon of Saturn. Four columns, MXT-1, 20, 1701 and MXT-UPLOT², are “en route” towards the comet Churyumov-Gerasimenko in the frame of the ESA Rosetta mission launched in 2004 to be arrived by 2014.

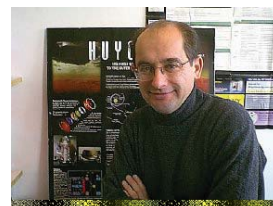
They will be used for the first time *in situ* analysis of a cometary nucleus. And finally, so far, 4 other PLOT (MXT U) and WCOT^{3,4} (MXT-1, 20 and CLP) columns have been selected and are currently being built in the GC of the Sample Analysis at Mars (SAM) Pyr/GCMS instrument, part of the payload of the NASA MSL 2009 Mars exploratory mission.

I would like to mention that all the columns selected for space mission are Silcosteel Treated metallic capillary columns and they have all been submitted successfully to space qualification tests such as vibration, radiation and thermal cycles⁵, which demonstrated their robustness for space application.

Since the beginning, the Restek company has been more than a manufacturer providing LISA with columns. Indeed, it has been strongly collaborating and helping LISA to develop custom-made columns able to meet the requirements of such an unusual scientific goal for chromatographic columns. That is why LISA is very grateful to Restek for being this ideal partner without the help of which the study and development of chromatographic columns for space use could not have been possible.”

Robert STERNBERG

Responsible for the space GC team at LISA (Paris, France)



References

¹Sternberg, R., C. Szopa, D. Coscia, S. Zubrzycki, F. Raulin, C. Vidal-Madjar, H. Niemann and G. Israel *J. Chromatogr.*, 846, 307-315, (1999)

²C. Szopa, R. Sternberg, F. Raulin and H. Rosenbauer *Planetary and Space Science*, 51 (13) 863-877 (2003)

³Cabane, M., P. Coll, C. Szopa, G. Israël, F. Raulin, R. Sternberg, P. Mahaffy, A. Person, C. Rodier, R. Navarro-Gonzalez, H. Niemann, R. Harpold and W. Brinckerhoff *Adv. Space Research*, 33, 2240-2245 (2004)

⁴Zampolli, M-G., D. Meunier, R. Sternberg, C. Szopa., F. Raulin, M. C. Pietrogrande, F. Dondi *Chirality* 18 (5):383-394 (2006)

⁵C. Szopa, U.J. Meierhenrich, D. Coscia, L. Janin, F. Goesmann, R. Sternberg, J.-F. Brun, G. Israel, M. Cabane, R. Roll, F. Raulin, W. Thiemann and C. Vidal-Madjar and H. Rosenbauer *J. Chromatogr. A*, 982 303-312 (2002)



MXT®-1 (nonpolar phase; Crossbond® 100% dimethyl polysiloxane)

- General purpose columns for solvent impurities, PCB congeners or (e.g.) Aroclor® mixes, simulated distillation, drugs of abuse, gases, natural gas odorants, sulfur compounds, essential oils, hydrocarbons, semivolatiles, pesticides, oxygenates.
- Temperature range: -60°C to 400°C.
- Equivalent to USP G1, G2, G38 phases.

MXT®-1 columns exhibit long lifetime and very low bleed at high operating temperatures. A proprietary synthesis process eliminates residual catalysts that could cause degradation and increase bleed.

MXT®-1 Columns (Silcosteel® treated stainless steel)

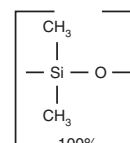
(Crossbond® 100% dimethyl polysiloxane)

ID	df (µm)	temp. limits	6-Meter	15-Meter	30-Meter	60-Meter	105-Meter
0.25mm	0.10	-60 to 330/400°C		70105	70116	70117	70114
	0.25	-60 to 360°C		70120	70123	70126	70129
	0.50	-60 to 350°C		70135	70138	70141	70144
	1.00	-60 to 340°C		70150	70153	70156	70159
0.28mm	0.10	-60 to 360°C	70102*	70106	70109		
	0.25	-60 to 360°C		70121	70124	70127	
	0.50	-60 to 330°C		70136	70139	70142	
	1.00	-60 to 320°C		70151	70154	70157	
0.53mm	0.15	-60 to 285°C		70181	70184	70187	
	0.25	-60 to 400°C	70101**				
	0.25	-60 to 360°C		70122	70125	70128	
	0.50	-60 to 330°C		70137	70140	70143	
0.53mm	1.00	-60 to 320°C		70152	70155	70158	
	1.50	-60 to 310°C		70167	70170	70173	
	3.00	-60 to 285°C		70182	70185	70188	70189
	5.00	-60 to 270°C		70177	70179	70183	
	7.00	-60 to 250°C		70191	70192	70193	
	7.00	-60 to 250°C		70191	70192	70193	
ID	df (µm)	temp. limits	10-Meter	20-Meter	40-Meter		
0.18mm	0.20	-60 to 330/350°C	71811	71812	71813		
	0.40	-60 to 320/340°C	71814	71815	71816		

Maximum temperatures listed are for 15- and 30-meter lengths. Longer lengths may have a slightly reduced maximum temperature.

*Temperature limits are -60 to 400°C.

**For simulated distillation.

**MXT®-1
Structure**similar **phases**

DB-1, DB-1MS, HP-1, HP-1MS,
Ultra-1, SPB-1, Equity-1,
MDN-1

**Quality Assurance Group**

Steve Constable, Corby Hillard, Jim Richards, Glenn Gerhab, Chris Zucco, Lenny Miller,
Scott Sharp, Deb Conklin, Scott Civils, Trisha Houser

MXT®-1HT Sim Dist / MXT®-1 Sim Dist / MXT®-500 Sim Dist

MXT®-1HT Sim Dist / MXT®-1 Sim Dist / MXT®-500 Sim Dist (nonpolar phases)

- Application-specific columns in unbreakable Siltek® treated stainless steel tubing meet all resolution criteria for high temperature simulated distillation (e.g., ASTM Method D-6352).
- MXT®-1HT Sim Dist and MXT®-1 Sim Dist phases offer true methyl silicone polarity; MXT®-500 Sim Dist phase is a carborane siloxane polymer.
- MXT®-1HT Sim Dist and MXT®-500 Sim Dist stable to 430°C, MXT®-1 Sim Dist stable to 400°C.

Manufactured from Siltek® treated stainless steel tubing, MXT® columns are the most durable high temperature GC columns available. As outlined in ASTM Method D-6352, high temperature simulated distillation requires a column that can withstand temperatures to 430°C. MXT®-1HT Sim Dist and MXT®-500 Sim Dist columns exhibit excellent peak shape and low bleed, even at 430°C! The unique MXT®-1HT Sim Dist methyl silicone polymer gives the correct retention time/boiling point curve. The MXT®-500 Sim Dist carborane siloxane polymer offers a slight shift in the calculated boiling range distribution for petroleum samples containing aromatic hydrocarbons.

similar phases

DB-1HT

MXT®-1HT Sim Dist Column (Siltek® treated stainless steel)

ID	df (μm)	temp. limits	5-Meter
0.53mm	0.10	-60 to 430°C	70100

MXT®-1 Sim Dist Column (Siltek® treated stainless steel)

ID	df (μm)	temp. limits	6-Meter
0.53mm	0.15	-60 to 400°C	70101

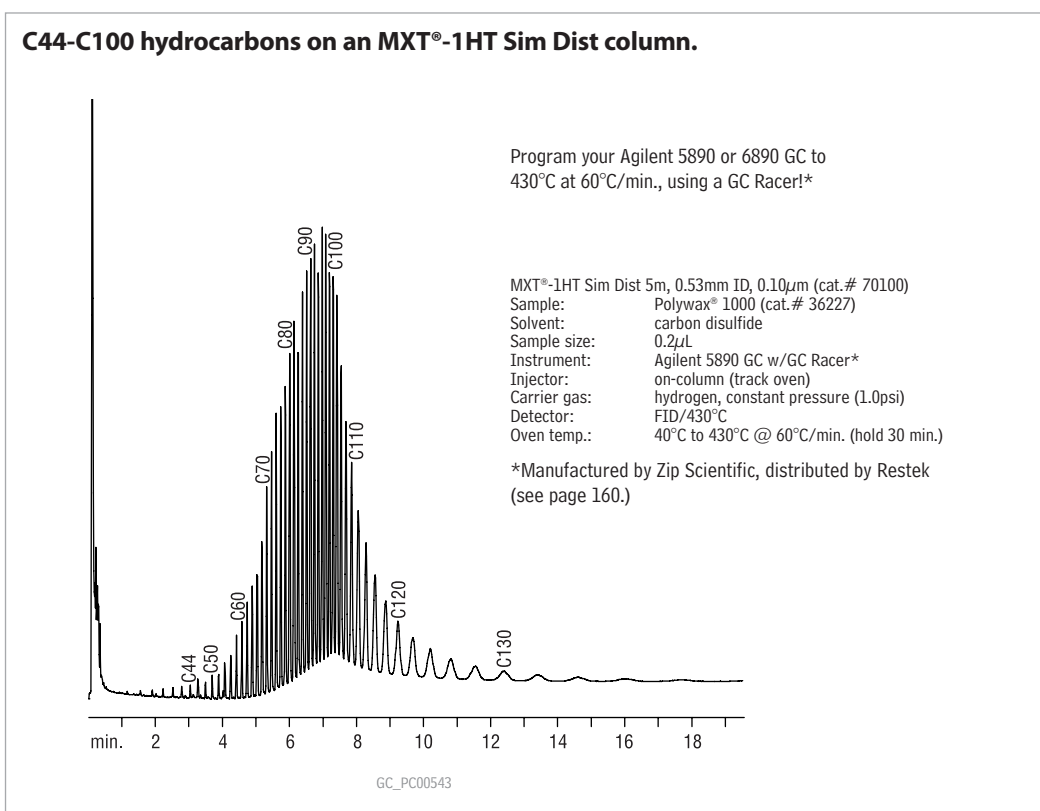
MXT®-500 Sim Dist Column (Siltek® treated stainless steel)

ID	df (μm)	temp. limits	6-Meter
0.53mm	0.15	-60 to 430°C	70104

Polywax® Calibration Materials

Description	qty.	cat.#
Polywax® 655 calibration material	1 gram	36225
Polywax® 1000 calibration material	1 gram	36227

C44-C100 hydrocarbons on an MXT®-1HT Sim Dist column.



MXT®-2887 (nonpolar phase; Crossbond® 100% dimethyl polysiloxane)

- Application-specific columns for simulated distillation.
- Stable to 400°C.

MXT®-2887 columns' stationary phase, column dimensions, and film thickness have been optimized to exceed the resolution and skewing factor requirements currently specified in ASTM method D-2887. Each column is individually tested to guarantee a stable baseline with low bleed and reproducible retention times. The Crossbond® methyl silicone stationary phase has increased stability compared to packed columns, ensuring stable baselines and shorter conditioning times. Manufactured from Silcosteel®-treated stainless steel tubing, MXT® columns are the most durable high temperature GC columns available.

MXT®-2887 Column (Silcosteel® treated stainless steel)

(Crossbond® 100% dimethyl polysiloxane—for simulated distillation)

ID	df (µm)	temp. limits	10-Meter
0.53mm	2.65	-60 to 400°C	70199

MXT®-5 (low-polarity phase; Crossbond® 5% diphenyl / 95% dimethyl polysiloxane)

- General purpose columns for drugs, solvent impurities, pesticides, hydrocarbons, PCB congeners or (e.g.) Aroclor® mixes, essential oils, semivolatiles.
- Temperature range: -60°C to 360°C.
- Equivalent to USP G27, G36 phases.

The 5% diphenyl/95% dimethyl polysiloxane stationary phase is the most popular GC stationary phase and is used in a wide variety of applications. All residual catalysts and low molecular weight fragments are removed from the MXT®-5 polymer, providing a tight mono-modal distribution and extremely low bleed.

MXT®-5 Columns (Silcosteel® treated stainless steel)

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

ID	df (µm)	temp. limits*	15-Meter	30-Meter	60-Meter
0.25mm	0.10	-60 to 360°C	70205	70208	70211
	0.25	-60 to 360°C	70220	70223	70226
	0.50	-60 to 350°C	70235	70238	70241
	1.00	-60 to 340°C	70250	70253	70256
0.28mm	0.25	-60 to 360°C	70221	70224	70227
	0.50	-60 to 330°C	70236	70239	70242
	1.00	-60 to 325°C	70251	70254	70257
	3.00	-60 to 290°C	70281	70284	70287
0.53mm	0.25	-60 to 360°C	70222	70225	70228
	0.50	-60 to 330°C	70237	70240	70243
	1.00	-60 to 325°C	70252	70255	70258
	1.50	-60 to 300°C	70267	70270	70273
	3.00	-60 to 290°C	70282	70285	70288
	5.00	-60 to 270°C	70277	70279	70283
ID	df (µm)	temp. limits	10-Meter	20-Meter	40-Meter
0.18mm	0.20	-60 to 325/340°C	71821	71822	71823
	0.40	-60 to 325/340°C	71824	71825	71826

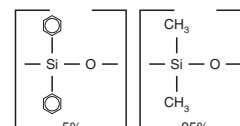
*Maximum temperatures listed are for 15- and 30-meter lengths. Longer lengths may have a slightly reduced maximum temperature.



Brian Salisbury
ASG Chemist

similar phases

DB-2887, Petrocol EX2887

MXT®-5 Structure

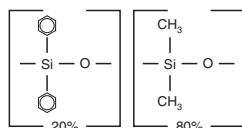
similar phases

DB-5, HP-5, HP-5MS, Ultra-2, SPB-5, Equity-5, MDN-5

Note: DB-5MS is a silarylene based polymer equivalent to Rtx®-5Sil MS.

MXT®-20 and MXT®-35

MXT®-20 Structure



MXT®-20 (low/mid-polarity phase; Crossbond® 20% diphenyl / 80% dimethyl polysiloxane)

- General purpose columns for volatile compounds, flavor compounds, alcoholic beverages.
- Temperature range: -20°C to 320°C.
- Equivalent to USP G28, G32 phases.

MXT®-20 polymer is synthesized to exacting standards. All residual catalysts and low molecular weight fragments are removed from the polymer, providing a tight mono-modal distribution and extremely low bleed.

MXT®-20 Columns (Silcosteel® treated stainless steel)

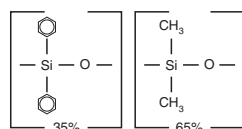
(Crossbond® 20% diphenyl / 80% dimethyl polysiloxane)

ID	df (µm)	temp. limits*	15-Meter	30-Meter	60-Meter
0.25mm	0.10	-20 to 320°C	70305	70308	70311
	0.25	-20 to 320°C	70320	70323	70326
	0.50	-20 to 310°C	70335	70338	70341
	1.00	-20 to 300°C	70350	70353	70356
0.28mm	0.25	-20 to 310°C	70321	70324	70327
	0.50	-20 to 300°C	70336	70339	70342
	1.00	-20 to 295°C	70351	70354	70357
	1.50	-20 to 280°C	70366	70369	70372
0.53mm	3.00	-20 to 260°C	70381	70384	70387
	0.25	-20 to 310°C	70322	70325	70328
	0.50	-20 to 300°C	70337	70340	70343
	1.00	-20 to 295°C	70352	70355	70358
	1.50	-20 to 280°C	70367	70370	70373
	3.00	-20 to 260°C	70382	70385	70388
	ID	df (µm)	temp. limits	10-Meter	20-Meter
0.18mm	0.20	-20 to 300/320°C	71831	71832	71833
	0.40	-20 to 300/320°C	71834	71835	71836

similar phases

SPB-20, VOCOL

MXT®-35 Structure



MXT®-35 (mid-polarity phase; Crossbond® 35% diphenyl / 65% dimethyl polysiloxane)

- General purpose columns for organochlorine pesticides, PCB congeners or (e.g.) Aroclor® mixes, herbicides, pharmaceuticals, sterols, rosin acids, phthalate esters.
- Temperature range: 0°C to 320°C.
- Equivalent to USP G42 phase.

MXT®-35 Columns (Silcosteel® treated stainless steel)

(Crossbond® 35% diphenyl/65% dimethyl polysiloxane)

ID	df (µm)	temp. limits*	15-Meter	30-Meter	60-Meter
0.25mm	0.50	0 to 310°C	70435	70438	
	1.00	0 to 300°C	70450	70453	
0.53mm	1.00	0 to 260/280°C	70452	70455	70458
	1.50	0 to 250/270°C	70467	70470	70473
	3.00	0 to 240/260°C	70482	70485	70488
ID	df (µm)	temp. limits	10-Meter	20-Meter	40-Meter
0.18mm	0.20	0 to 300/320°C	71841	71842	71843
	0.40	0 to 290/310°C	71844	71845	71846

similar phases

DB-35, HP-35, SPB-35,
SPB-608

*Maximum temperatures listed are for 15- and 30-meter lengths. Longer lengths may have a slightly reduced maximum temperature.

MXT®-50 (mid-polarity phase; Crossbond® 100% methylphenyl polysiloxane)

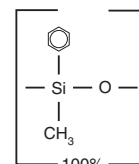
- General purpose columns for pesticides, herbicides, rosin acids, phthalate esters, triglycerides, sterols.
- Temperature range: 0°C to 330°C.
- Equivalent to USP G3 phase.

MXT®-50 Columns (Silcosteel® treated stainless steel)

(Crossbond® 100% methylphenyl polysiloxane)

ID	df (μm)	temp. limits*	15-Meter	30-Meter	60-Meter
0.53mm	0.83	0 to 270/290°C		70569	
	1.00	0 to 260/280°C	70552	70555	70558
	1.50	0 to 250/270°C	70567	70570	70573
ID	df (μm)	temp. limits	10-Meter	20-Meter	40-Meter
0.18mm	0.20	0 to 310/330°C	71851	71852	71853
	0.40	0 to 300°C	71854	71855	71856

*Maximum temperatures listed are for 15- and 30-meter lengths. Longer lengths may have a slightly reduced maximum temperature.

MXT®-50 Structure

similar phases

HP-17, SPB-50, SP-2250

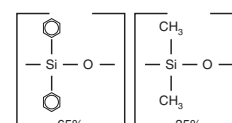
MXT®-65 (mid- to high polarity phase; Crossbond® 65% diphenyl / 35% dimethyl polysiloxane)

- General purpose columns for phenols, fatty acids.
- Temperature range: 50°C to 370°C.
- Equivalent to USP G17 phase.

MXT®-65 Columns (Silcosteel® treated stainless steel)

(Crossbond® 65% diphenyl/35% dimethyl polysiloxane)

ID	df (μm)	temp. limits	15-Meter	30-Meter	
0.25mm	0.25	50 to 300°C	77020	77023	
	0.50	50 to 300°C	77035	77038	
	1.00	50 to 280°C	77050	77053	
ID	df (μm)	temp. limits	10-Meter	20-Meter	40-Meter
0.18mm	0.20	20 to 370°C	71801	71802	71803
	0.40	20 to 370°C	71804	71805	71806

MXT®-65/MXT®-65TG Structure

similar phases

TAP-CB, 400-65HT, 007-65HT

MXT®-65TG (high polarity phase; Crossbond® 65% diphenyl / 35% dimethyl polysiloxane)

- Application-specific columns, specially tested for triglycerides.
- Stable to 370°C.

The MXT®-65TG phase resolves triglycerides by degree of unsaturation as well as by carbon number. Because of the chemistry required to achieve 370°C thermal stability, an MXT®-65TG column should not be used for analyses of compounds that contain active oxygenated groups.

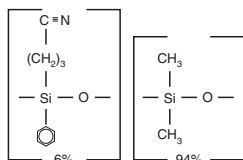
MXT®-65TG Columns (Silcosteel® treated stainless steel)

(Crossbond® 65% diphenyl/35% dimethyl polysiloxane)

ID	df (μm)	temp. limits	15-Meter	30-Meter
0.25mm	0.10	20 to 370°C	77005	77008
0.53mm	0.10	20 to 370°C	77007	77010

MXT[®]-1301 and MXT[®]-1701

MXT[®]-1301 Structure



similar phases

DB-1301, DB-624, HP-1301,
SPB-1301, SPB-624

MXT[®]-1301 (low to mid-polarity phase; Crossbond[®] 6% cyanopropylphenyl / 94% dimethyl polysiloxane)

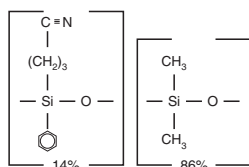
- General purpose columns for residual solvents, alcohols, oxygenates, volatile organic compounds.
- Temperature range: -20°C to 280°C.
- Equivalent to USP G43 phase.

MXT[®]-1301 Columns (Silcosteel[®] treated stainless steel)

(Crossbond[®] 6% cyanopropylphenyl/94% dimethyl polysiloxane)

ID	df (μm)	temp. limits*	15-Meter	30-Meter	60-Meter
0.25mm	0.25	-20 to 280°C	76020	76023	76026
	0.50	-20 to 270°C	76035	76038	76041
	1.00	-20 to 260°C	76050	76053	76056
0.28mm	0.25	-20 to 280°C	76021	76024	76027
	0.50	-20 to 270°C	76036	76039	76042
	1.00	-20 to 260°C	76051	76054	76057
0.53mm	1.50	-20 to 250°C	76066	76069	76072
	0.25	-20 to 280°C	76022	76025	76028
	0.50	-20 to 270°C	76037	76040	76043
	1.00	-20 to 260°C	76052	76055	76058
	1.50	-20 to 250°C	76067	76070	76073
	3.00	-20 to 240°C	76082	76085	76088

MXT[®]-1701 Structure



similar phases

DB-1701, HP-1701, SPB-1701

MXT[®]-1701 (mid-polarity phase; Crossbond[®] 14% cyanopropylphenyl / 86% dimethyl polysiloxane)

- General purpose columns for alcohols, oxygenates, PCB congeners or (e.g.) Aroclor[®] mixes, pesticides.
- Temperature range: -20°C to 280°C.
- Equivalent to USP G46 phase.

MXT[®]-1701 Columns (Silcosteel[®] treated stainless steel)

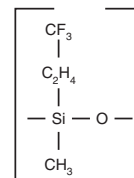
(Crossbond[®] 14% cyanopropylphenyl/86% dimethyl polysiloxane)

ID	df (μm)	temp. limits*	15-Meter	30-Meter	60-Meter
0.25mm	0.25	-20 to 280°C	72020	72023	72026
	0.50	-20 to 280°C	72035	72038	72041
	1.00	-20 to 260°C	72050	72053	72056
0.28mm	0.25	-20 to 280°C	72021	72024	72027
	0.50	-20 to 270°C	72036	72039	72042
	1.00	-20 to 260°C	72051	72054	72057
0.53mm	1.50	-20 to 250°C	72066	72069	72072
	0.25	-20 to 280°C	72022	72025	72028
	0.50	-20 to 270°C	72037	72040	72043
	1.00	-20 to 260°C	72052	72055	72058
	1.50	-20 to 250°C	72067	72070	72073
	3.00	-20 to 240°C	72082	72085	72088
ID	df (μm)	temp. limits	10-Meter	20-Meter	40-Meter
0.18mm	0.20	-20 to 270/280°C	71871	71872	71873
	0.40	-20 to 270/280°C	71874	71875	71876

*Maximum temperatures listed are for 15- and 30-meter lengths. Longer lengths may have a slightly reduced maximum temperature.

MXT®-200 (mid-polarity phase; Crossbond® trifluoropropylmethyl polysiloxane)

- General purpose columns for solvents, Freon® fluorocarbons, alcohols, ketones, silanes, glycols. Excellent confirmation column, with an Rtx®-5 column, for phenols, nitrosamines, organochlorine pesticides, chlorinated hydrocarbons, chlorophenoxy herbicides.
- Temperature range: -20°C to 330°C.
- Equivalent to USP G6 phase.

MXT®-200 Structure**MXT®-200 Columns** (Silcosteel® treated stainless steel)

(Crossbond® trifluoropropylmethyl polysiloxane)

ID	df (μm)	temp. limits*	15-Meter	30-Meter	60-Meter
0.25mm	0.50	-20 to 330°C	75035	75038	
	1.00	-20 to 310°C	75050	75053	
0.53mm	1.00	-20 to 290/310°C	75052	75055	75058
	1.50	-20 to 280/300°C	75067	75070	75073
	3.00	-20 to 260/280°C	75082	75085	75088
ID	df (μm)	temp. limits	10-Meter	20-Meter	40-Meter
0.18mm	0.20	-20 to 310/330°C	71881	71882	71883
	0.40	-20 to 310/330°C	71884	71885	71886

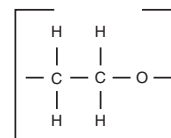
*Maximum temperatures listed are for 15- and 30-meter lengths. Longer lengths may have a slightly reduced maximum temperature.

similar phases

DB-200, DB-210

MXT®-WAX (polar phase; Crossbond® Carbowax® polyethylene glycol)

- General purpose columns for FAMES, flavor compounds, essential oils, amines, solvents, xylene isomers, US EPA Method 603 (acrolein/acrylonitrile).
- Resistant to oxidative damage.
- Temperature range: 40°C to 260°C.
- Equivalent to USP G14, G15, G16, G20, G39 phases.

MXT®-WAX Structure**MXT®-WAX Columns** (Silcosteel® treated stainless steel)

(Crossbond® Carbowax® polyethylene glycol—provides oxidation resistance)

ID	df (μm)	temp. limits	15-Meter	30-Meter	60-Meter
0.25mm	0.10	40 to 260°C	70605	70608	70611
	0.25	40 to 260°C	70620	70623	70626
	0.50	40 to 260°C	70635	70638	70641
0.28mm	0.25	40 to 250°C	70621	70624	70627
	0.50	40 to 250°C	70636	70639	70642
	1.00	40 to 240°C	70651	70654	70657
0.53mm	0.25	40 to 250°C	70622	70625	70628
	0.50	40 to 250°C	70637	70640	70643
	1.00	40 to 240°C	70652	70655	70658
	1.50	40 to 230°C	70666	70669	70672
	2.00	40 to 220°C	70667	70670	
ID	df (μm)	temp. limits	10-Meter	20-Meter	40-Meter
0.18mm	0.20	40 to 250°C	71861	71862	71863
	0.40	40 to 250°C	71864	71865	71866

similar phases

DB-WAX, DB-WAXetr,
HP-Wax, HP-Innowax,
Supelcowax 10

MXT[®]-502.2 and MXT[®]-Volatiles



Steph Sunner
Customer Service
Representative

MXT[®]-502.2 (proprietary Crossbond[®] diphenyl / dimethyl polysiloxane phase)

- Application-specific columns with unique selectivity for volatile organic pollutants, cited in US EPA Method 502.2 and in many gasoline range organics (GRO) methods for monitoring underground storage tanks. Excellent separation of trihalomethanes; ideal polarity for light hydrocarbons and aromatics.
- Stable to 270°C.

An MXT[®]-502.2 column will enable you to quantify all compounds listed in US EPA methods 502.2 or 524.2, whether you use a mass spectrometer or a PID in tandem with an ELCD. The diphenyl/dimethyl polysiloxane based MXT[®]-502.2 stationary phase provides low bleed and thermal stability to 270°C. A 105-meter column can separate the light gases specified in EPA methods without subambient cooling.

MXT[®]-502.2 Columns (Silcosteel[®] treated stainless steel)

(proprietary Crossbond[®] diphenyl / dimethyl polysiloxane phase)

ID	df (μm)	temp. limits	30-Meter	60-Meter	105-Meter
0.25mm	1.40	-20 to 270°C	70915	70916	
0.28mm	1.60	-20 to 250°C	70919	70920	70921
0.53mm	3.00	-20 to 270°C	70908	70909	70910
ID	df (μm)	temp. limits	10-Meter	20-Meter	
0.18mm	1.00	-20 to 270°C	71891	71892	

similar phases

DB-502.2

MXT[®]-Volatiles (proprietary Crossbond[®] diphenyl / dimethyl polysiloxane phase)

- Application-specific columns for volatile organic pollutants.
- Stable to 280°C.

MXT[®]-Volatiles columns were the first columns designed specifically for analyses of the 34 volatile organic pollutants listed in US EPA methods 601, 602, and 624. With these columns, you can quantify all compounds listed in these methods, whether you use a mass spectrometer or a PID in tandem with an ELCD. The diphenyl/dimethyl polysiloxane based MXT[®]-Volatiles stationary phase provides low bleed and thermal stability to 280°C.

MXT[®]-Volatiles Columns (Silcosteel[®] treated stainless steel)

(proprietary Crossbond[®] diphenyl / dimethyl polysiloxane phase)

ID	df (μm)	temp. limits*	30-Meter	60-Meter	105-Meter
0.25mm	1.00	-20 to 280°C	70900	70903	
0.28mm	1.25	-20 to 280°C	70924	70926	70928
0.53mm	2.00	-20 to 280°C	70925	70927	70929
	3.00	-20 to 250°C	70922	70923	

*Maximum temperatures listed are for 15- and 30-meter lengths. Longer lengths may have a slightly reduced maximum temperature.

similar phases

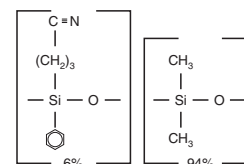
VOCOL[®]

MXT®-624 (low to mid-polarity phase; Crossbond® 6% cyanopropylphenyl / 94% dimethyl polysiloxane)

- Application-specific columns for volatile organic pollutants. Recommended in US EPA methods for volatile organic pollutants.
- Temperature range: -20°C to 240°C.
- Equivalent to USP G43 phase.

The unique polarity of “624” columns makes them ideal for analyses of volatile organic pollutants. Although the MXT®-502.2 column is recommended in many methods, MXT®-624 columns offer the best separation of the early-eluting gases.

MXT®-624 Structure



MXT®-624 Columns (Silcosteel® treated stainless steel)

(Crossbond® 6% cyanopropylphenyl/94% dimethyl polysiloxane)

ID	df (µm)	temp. limits	30-Meter	60-Meter	75-Meter	105-Meter
0.25mm	1.40	-20 to 240°C	70968	70969		
0.53mm	3.00	-20 to 240°C	70971	70973	70974	70975
ID	df (µm)	temp. limits	10-Meter	20-Meter		
0.18mm	1.00	-20 to 240°C	71893	71894		

similar phases

DB-624, HP-624

MXT®-BAC1 / MXT®-BAC2 (proprietary Crossbond® phase)

- Application-specific columns for blood alcohol analysis, achieving baseline resolution in less than 3 minutes. Also excellent for abused inhalant anesthetics, γ-hydroxybutyrate (GHB) / γ-butyrolactone (GBL), glycols, and common industrial solvents.
- Stable to 240°C.

These columns separate to baseline all blood alcohol compounds in blood, breath, or urine, in less than 3 minutes, under isothermal conditions. Isothermal analysis increases productivity by eliminating the need for oven cycling. Confirmation is easily achieved with this tandem set because there are four elution order changes between the two columns.

MXT®-BAC1 Column (Silcosteel® treated stainless steel)

ID	df (µm)	temp. limits	30-Meter
0.53mm	3.00	-20 to 240°C	78001

similar phases

DB-ALC1, DB-ALC2

MXT®-BAC2 Column (Silcosteel® treated stainless steel)

ID	df (µm)	temp. limits	30-Meter
0.53mm	2.00	-20 to 240°C	78000