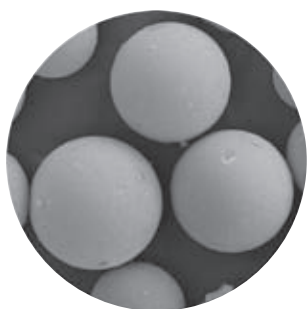




ASTRA® HPLC columns extend our ARION® and CHROMSHELL® product lines. The ASTRA® has been developed in the Czech Republic to offer an alternate to a broad range of general HPLC columns. ASTRA® brings completely new and unique stationary phase with the polar embedded group to offer a complementary selectivity.

- Unique and high endcapped C18 phases.
- 330 m²/g surface area (170 m²/g for BDS phases).
- Multi-modal phase.

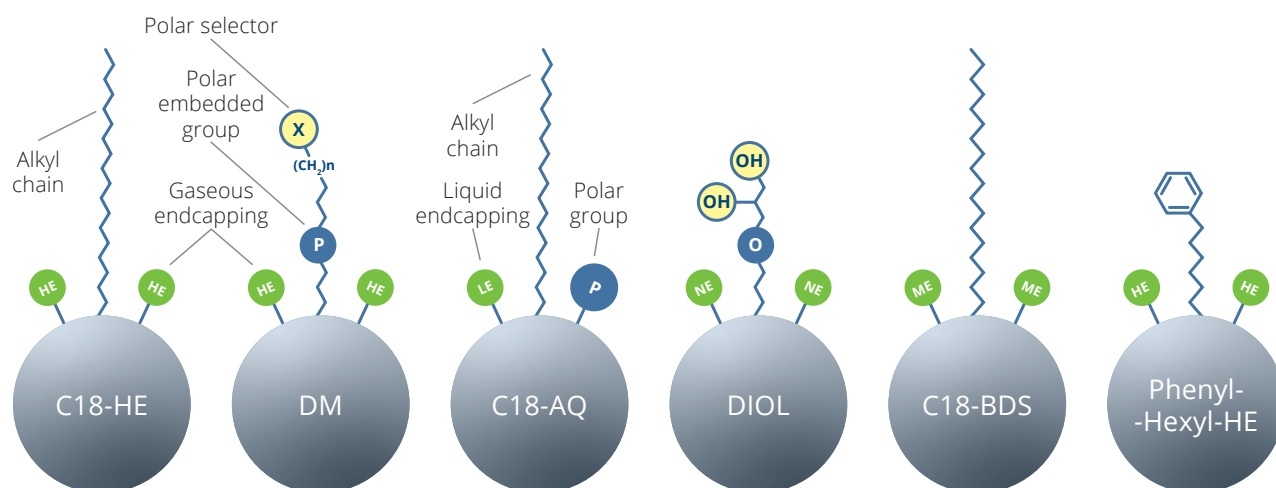


ASTRA® Silicagel

	5 µm	3 µm	2 µm
Particle size	5 µm	3 µm	2 µm
Metal content	<10 ppm	<10 ppm	<10 ppm
Mean particle diameter	4.6 ± 1.2 µm	3.0 ± 0.7 µm	2.1 ± 0.4 µm
Proximity to the shape of sphere	0.97 ± 0.04	0.97 ± 0.03	0.97 ± 0.03

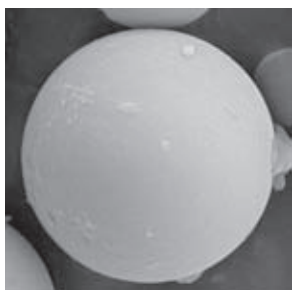
ASTRA® phases	Particle size (µm)	Pore size (Å)	Surface area (m ² /g)	Carbon load	pH stability	Endcapping	100% aqueous mobile phase	USP code
C18-HE	2, 3, 5, 10	100	330	17 %	2 to 9	High	×	L1
C18-AQ	2, 3, 5	100	330	13 %	2 to 9	Mixed	✓	L1
C18-BDS	3, 5	140	170	11 %	2 to 8	Proprietary	×	L1
C8-HE	5	100	330	11 %	2 to 9	High	×	L7
C8-BDS	3, 5	140	170	6 %	2 to 8	Proprietary	×	L7
Phenyl-Hexyl-HE	3, 5	100	330	11 %	2 to 7.5	High	×	L11
DM	3, 5	100	205	12 %	2 to 9	High	×	-
Diol	3, 5	100	330	5 %	2 to 7.5	-	✓	L20

ASTRA® phases	Particle size (µm)	Crosslinking	Max. Flow rate	Max. Pressure (bar)	Max Temperature	USP code
Sugar Ca(S)	9, 10	Proprietary	1.5 mL/min	60	90	L19
Sugar H(S)	9, 10	Proprietary	1.5 mL/min	60	90	L17
Sugar K(S)	10	Proprietary	1.5 mL/min	60	90	-
Sugar Na(S)	10	Proprietary	1.5 mL/min	60	90	L58

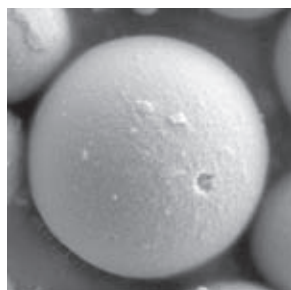


Up close

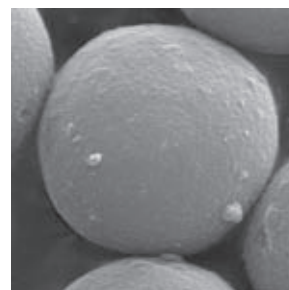
As with all phases developed by Chromservis, ASTRA® HPLC column particles are continuously analysed by SEM. The electron microscope shows the very high quality of ASTRA® 3 and 5µm particles.



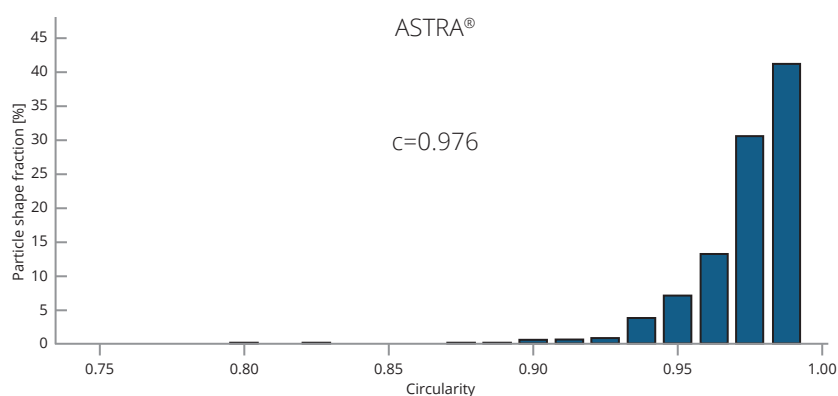
ASTRA® particle 5 µm



ASTRA® particle 3 µm

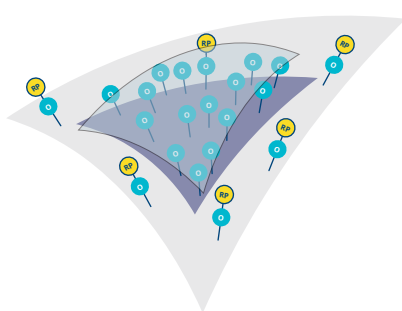


ASTRA® particle 2 µm

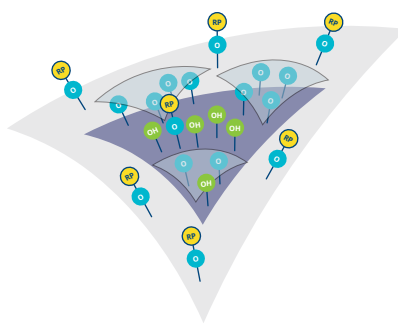


Main particle characteristics:

- Close proximity to a sphere.
- Highly effective endcapping.
- No broken particles.
- Robustness to high pressures.
- Lot-to-lot reproducibility.
- Unique modern embedded phases.



High endcapping



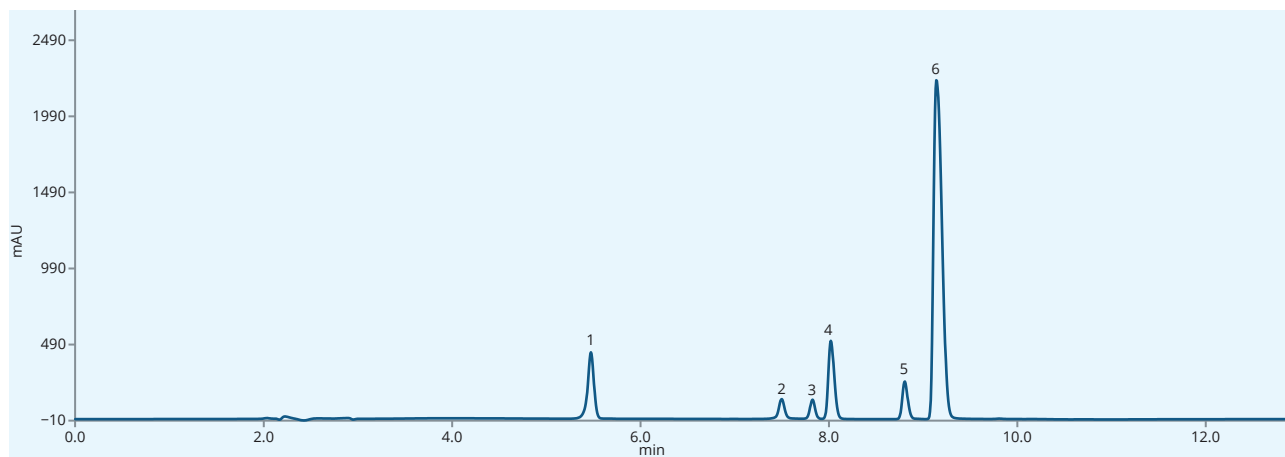
Low endcapping



Non endcapped

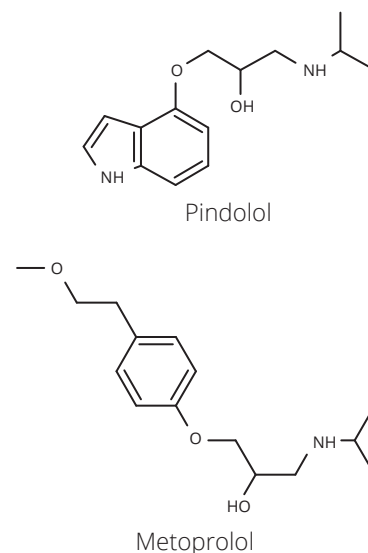
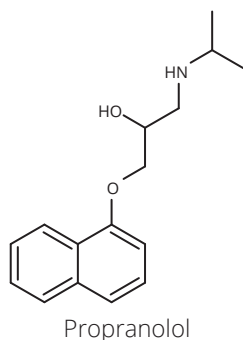
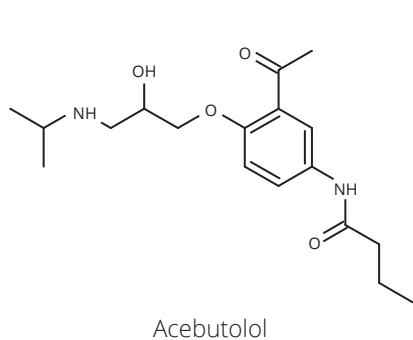
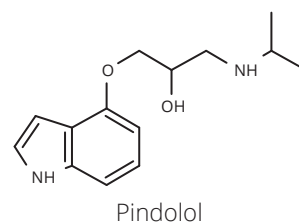
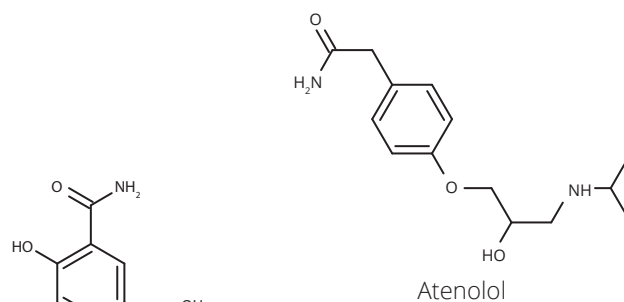
Beta Blockers

Beta Blockers are also known as beta-adrenergic blocking agents. They are used as a medication that reduces blood pressure.



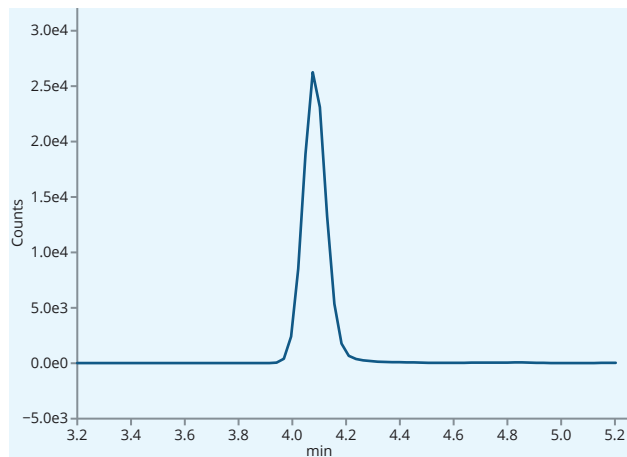
Standard mixture on ASTRA® C18-HE column

Columns	ASTRA® C18-HE, 5 µm			
Dimensions	150 mm × 4.6 mm			
Part numbers	AST-5732-LK46			
Mobile phase	A: Phosphate buffer 20mM, pH 2.5 B: ACN			
Gradient elution	Time	A (%)	B (%)	Flow rate (mL/L)
	0	95	5	0.75
	3	85	15	1.00
	8	50	50	1.00
	12	95	5	1.00
	13	95	5	0.75
Flow rate	See gradient table (mL/L)			
Temperature	25 °C			
Detection	UV @250 nm			
Analytes	1. Atenolol, CAS No. 29122-68-7 2. Pindolol, CAS No. 13523-86-9 3. Acebutolol, CAS No. 37517-30-9 4. Metoprolol, CAS No. 37350-58-6 5. Labetalol, CAS No. 36894-69-6 6. Propranolol, CAS No. 525-66-6			

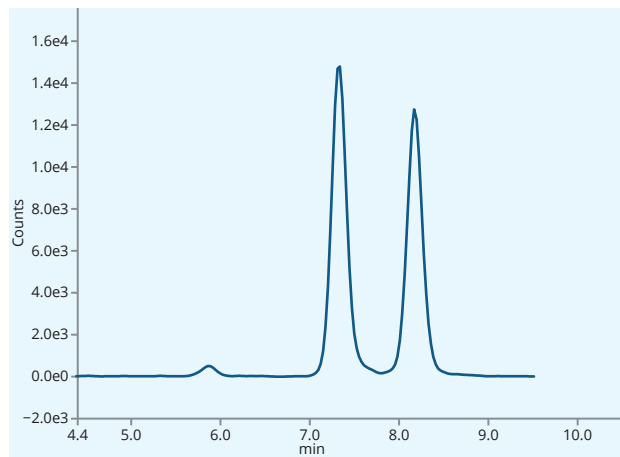


API glucuronide by LC/MS

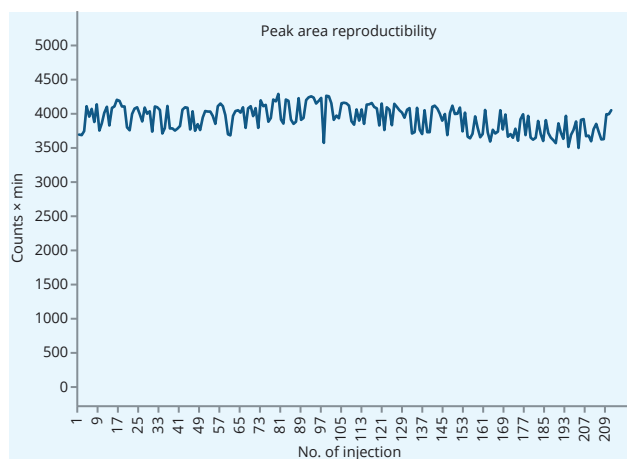
This application shows high ASTRA[®] HPLC column stability in the pharmacokinetic assay. API is used in hypolipidemic therapy adjusting cholesterol levels in the human body.



Scan 1 – API glucuronide



Scan 2 – API isomers



Plasma sample on ASTRA[®] C18-HE column

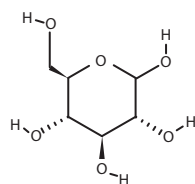
Column	ASTRA [®] C18-HE, 5 µm
Dimensions	150 mm × 4.6 mm
Part number	AST-5732-LK46
Mobile phase	MeOH : ACN : Water : 0.1% NH ₄ OH 25/50/20/5 (v/v/v/v) Isocratic elution
Flow rate	0.45 mL/min
Temperature	Ambient
Injection volume	15 µL
Detection	MS/MS
Mode	ESI, Negative 2500 eV
MS Temperature	350 °C (capillary), 380 °C (vaporizer)
Collision gas	Argon
Instrument	TSQ Quantiva (Thermo Fisher Scientific)
Analytes	1. API (proprietary)

Compound name	Q1 (m/z)	Q2 (m/z)	Collision cell pressure	Collision energy
API Glucuronide D4	588	275	2 mTorr	29 eV
API D	412	275	2 mTorr	29 eV

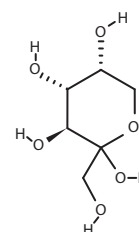
Sugars in infusion solutions

Sugars solutions in the form of infusions can be used to treat low blood sugar and water loss and as part of parenteral nutrition to optimise fluid, energy and nitrogen balance. As active ingredients of finished dosage forms, sugars should be controlled according to the strict requirements of pharmaceutical guidelines. In this application there are the results of the control of several solutions containing glucose, fructose and mannitol using Astra® Sugar Ca(S) column.

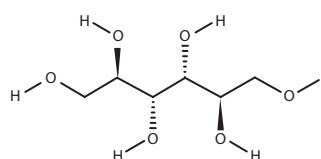
Column	ASTRA® Sugar Ca(S), 10 µm
Dimensions	300 mm × 8.0 mm
Part number	AST-5906-VN80
Mobile phase	100% H ₂ O
Flow rate	0.8 mL/min
Temperature	80 °C
Injection volume	20 µL
Detection	RID @55 °C
Analytes	1. Glucose 2. Fructose 3. Mannitol



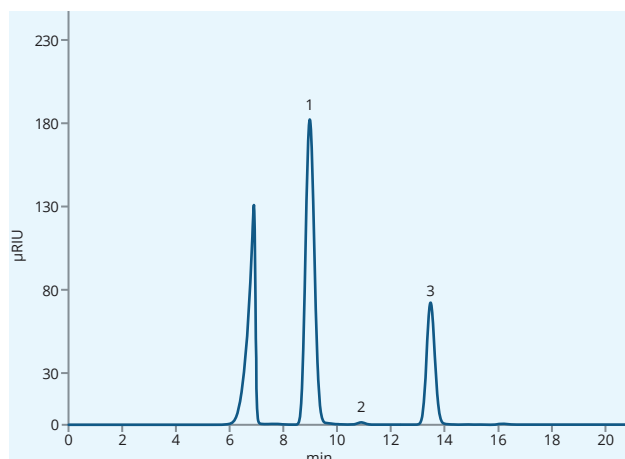
Glucose



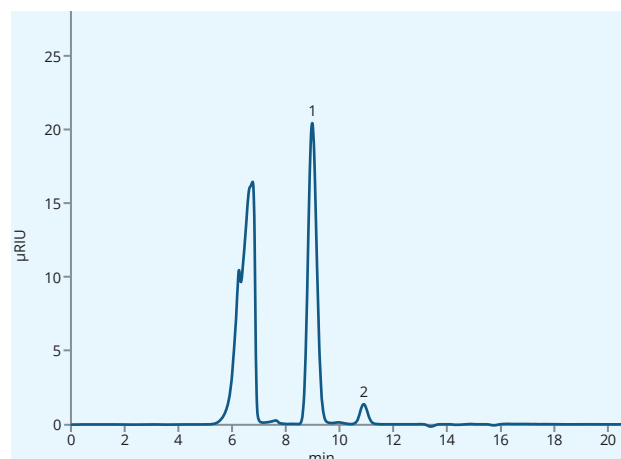
Fructose



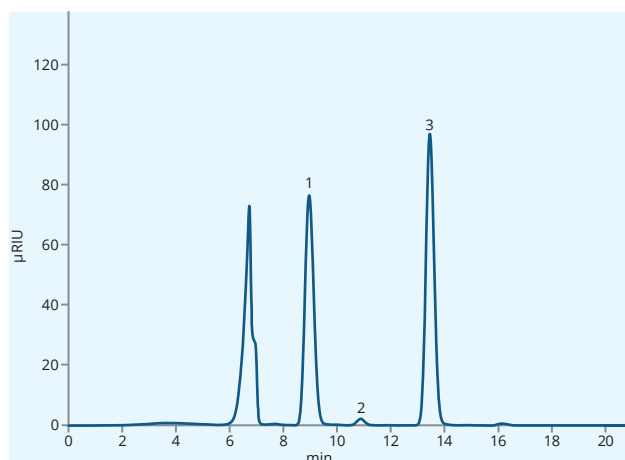
Mannitol



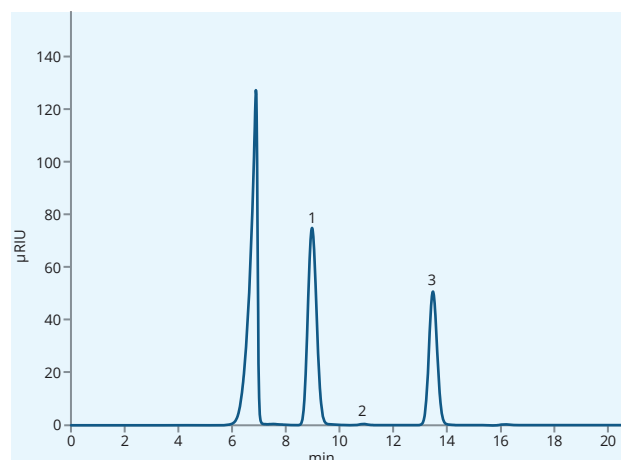
Test solution 1 on ASTRA® Sugar Ca(S) column



Test solution 2 on ASTRA® Sugar Ca(S) column



Test solution 3 on ASTRA® Sugar Ca(S) column

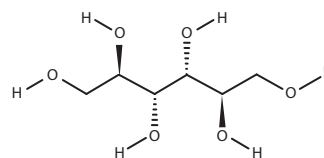


Test solution 4 on ASTRA® Sugar Ca(S) column

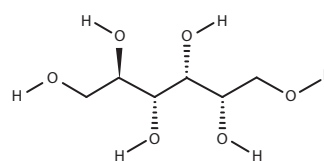
Sorbitol analysis according to Ph. Eur.

Sorbitol is a sugar alcohol commonly used as a sweetener and stabilizer in a wide range of pharmaceutical formulations. This application shows a method of control of sorbitol according to **Ph. Eur. Monograph 07/2019:0436**. Astra[®] Sugar Ca(S) column provides a perfect resolution factor and peak symmetry under the conditions of the pharmacopoeial method.

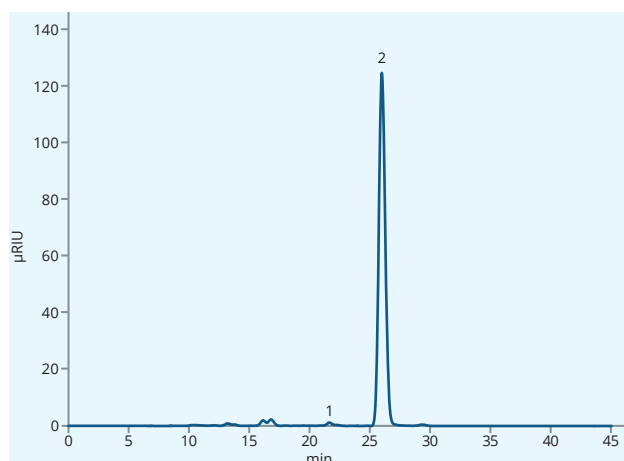
Column	ASTRA [®] Sugar Ca(S), 9 µm
Dimensions	300 mm × 8.0 mm
Part number	AST-5906-WN80
Mobile phase	100% H ₂ O
Flow rate	0.5 mL/min and 0.75 mL/min
Temperature	80 °C
Injection volume	20 µL
Detection	RID @55 °C
Analytes	1. Mannitol 2. Sorbitol



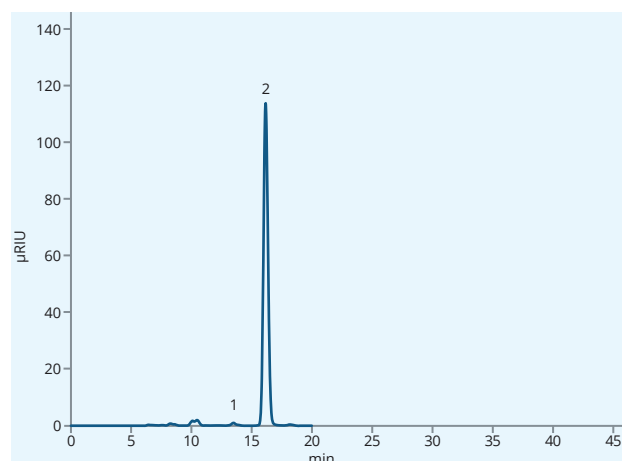
Mannitol



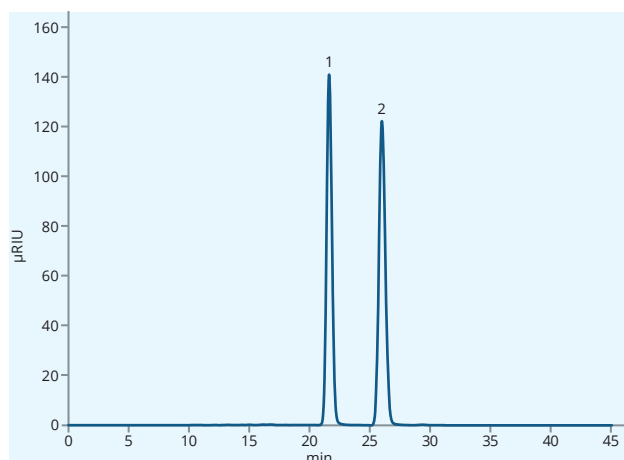
Sorbitol



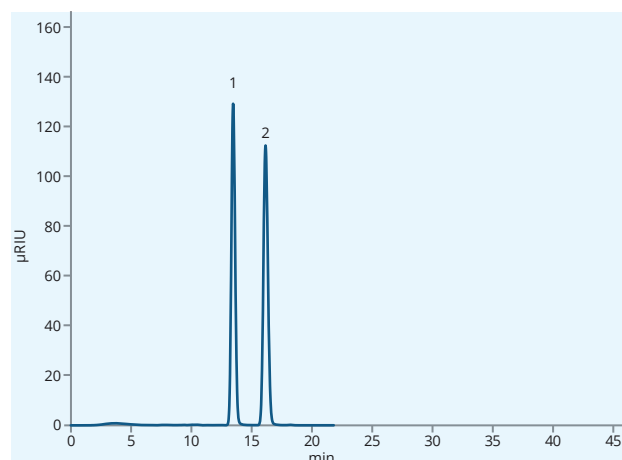
Test solution on ASTRA[®] Sugar Ca(S) column (0.5 mL/min)



Test solution on ASTRA[®] Sugar Ca(S) column (0.75 mL/min)



Reference solution (b) on ASTRA[®] Sugar Ca(S) column (0.5 mL/min)



Reference solution (b) on ASTRA[®] Sugar Ca(S) column (0.75 mL/min)

Analysis of long-chain PFASs in biological sample matrix

PFASs are a group of synthetic organofluorine chemical compounds used in the production of fluoropolymer coatings and products such as furniture, adhesives, personal care products, food packaging, mobile phone screens, etc. Many PFASs pose health and environmental concerns because they are classified as persistent organic pollutants. The long-chain PFASs are due to higher bioaccumulative potential frequently detected in living organisms. This application shows a robust method of extraction and determination of the PFAS compounds in fish biota samples, which can be a relevant exposure pathway for humans.

MSPE with 15 mg of C18 stationary phase and nylon frits was used to analyze 14 PFAS compounds in fish tissue samples. The MSPE sample preparation approach was compared with the reference extraction method without SPE based on Grabicova et al. 2018 [1]. Both sets of samples were fortified to 1 ng/g of PFAS. The MSPE method enhances the response of most of the analytes between 80–130 % (Fig. 1). Although sample preparation is more demanding than the reference method, the MSPE offers relevant signal improvement.

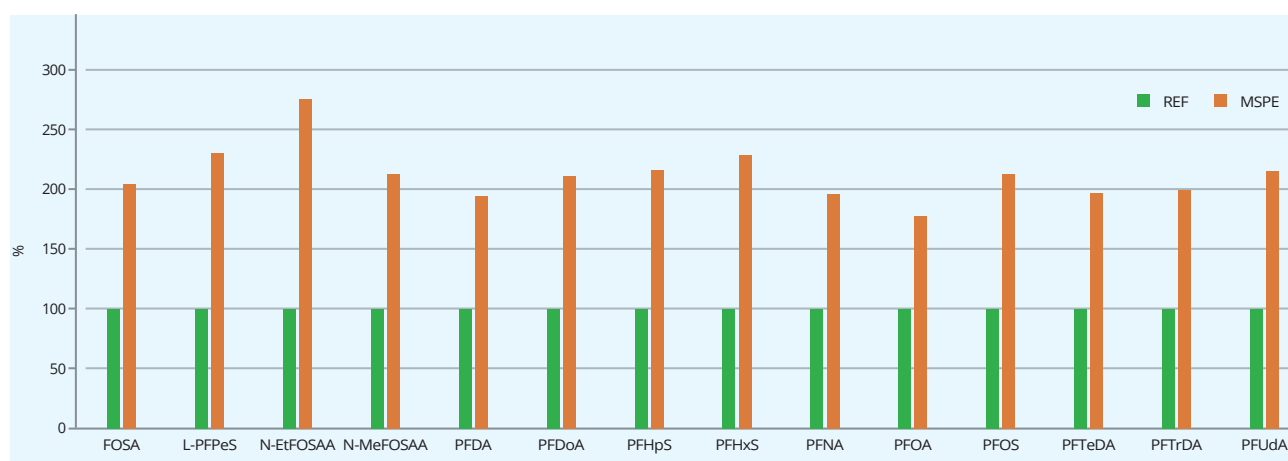
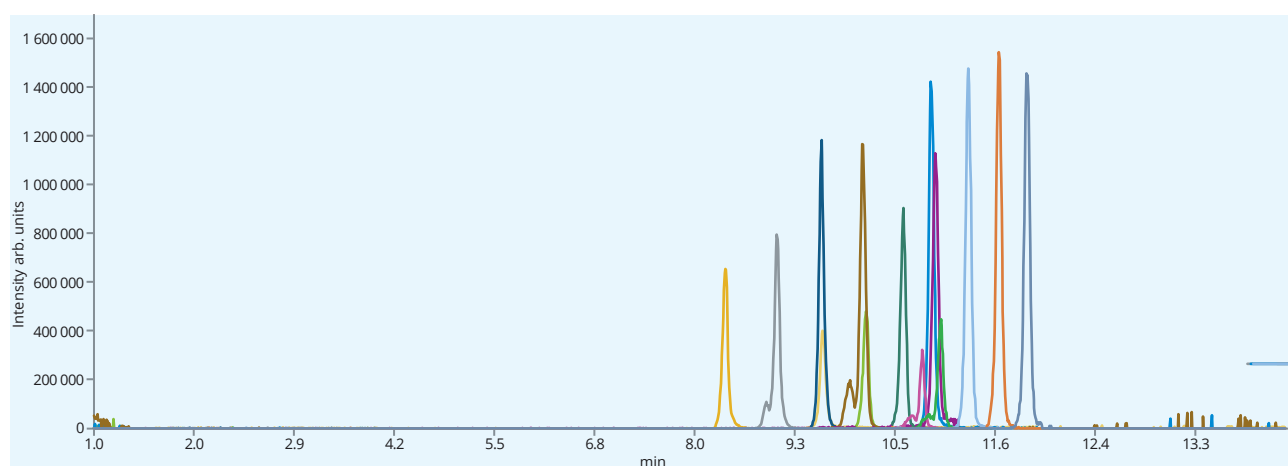


Fig 1. MSPE method relative signal improvement in comparison to the reference extraction method without SPE



Mixture of PFASs on ASTRA® column

References

[1] Grabicova K, Vojs Staňová A, Koba Ucin O, Borik A, Randak T, Grabic R. Development of a robust extraction procedure for the HPLC-ESI-HRPS determination of multi-residual pharmaceuticals in biota samples. *Anal Chim Acta*. 2018 Aug 31;1022:53-60. doi: 10.1016/j.aca.2018.04.011. Epub 2018 Apr 18. PMID: 29729738.

This application was developed in cooperation with the Faculty of Fisheries and Protection of Waters, Research Institute of Fish Culture and Hydrobiology, Laboratory of Environmental Chemistry and Biochemistry.



Analysis of long-chain PFASs in biological sample matrix

MSPE Method

MSPE Column	Micro Spin SpeExtra™ MSPE C18 column with 0.22 µm Nylon membrane, 15 mg (p/n MSP-5876- AA07)
Homogenization	TissueLyser II, Quiagen, Germany, 1800 min ⁻¹ for 10 min
Extraction	ACN + 0.1% FA
Centrifugation	Mini spin, Eppendorf, Germany; 4000 rpm for 2 min
Reconstitution	DDW + 0.1% FA
Dissolution	Ultrasonic bath 5 min
MSPE Activation	DDW + MeOH (50:50)
MSPE Equilibration	DDW + 0.1% FA
MSPE Extraction of analytes	500 µL of sample
MSPE Elution of analytes	200 µL ACN + 0.1% FA

We strongly recommend to use PFAS suitable vials and caps (e.g. CHS silicone/PP septa and PP caps).



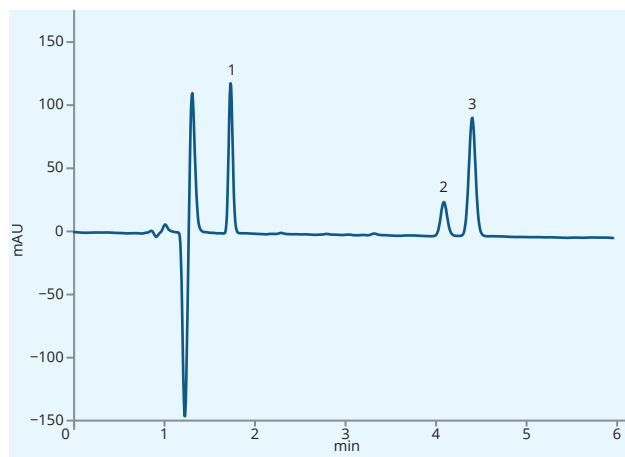
MSPE column

LC-HRMS Method

Column	ASTRA® C18-HE, 3 µm			
Dimensions	75 mm × 2.1 mm			
Part number	AST-5732-IH21			
Mobile phase	A: DDW + 10mM Ammonium Acetate B: Methanol + 10mM Ammonium Acetate			
Gradient elution	Time	A (%)	B (%)	Flow rate (µL/min)
	0	90	10	350
	0.5	90	10	350
	6	40	60	350
	11	0	100	400
	14	0	100	400
	14.01	90	10	350
	16	90	10	350
Temperature	23 °C			
Injection volume	10 µL			
Detection	Full scan (resolving power 120 000, m/z 200), negative mode			
Analytes	<ol style="list-style-type: none"> 1. L-PFPeS (perfluoropentanesulfonic acid) 2. PFHxS (perfluorohexanesulfonic acid) 3. PFOA (perfluorooctanoic acid) 4. PFHpS (perfluoroheptanesulfonic acid) 5. PFNA (perfluorononanoic acid) 6. FOSA (perfluorooctanesulfonamide) 7. PFOS (perfluorooctanesulfonic acid) 8. PFDA (perfluorodecanoic acid) 9. PFUdA (perfluoroundecanoic acid) 10. N-MeFOSAA (2-(N-methylperfluorooctanesulfonamido)acetic acid) 11. N-EtFOSAA (N-Ethyl-N-[(heptadecafluorooctyl)sulphonyl]glycine) 12. PFDoA (perfluorododecanoic acid) 13. PFTrDA (perfluorotridecanoic acid) 14. PFTeDA (perfluorotetradecanoic acid) 			

Stevia glycosides

Stevia rebaudiana Bertoni is a plant used for its sweet taste. It contains glycosides, which are used as sweeteners in the food industry.

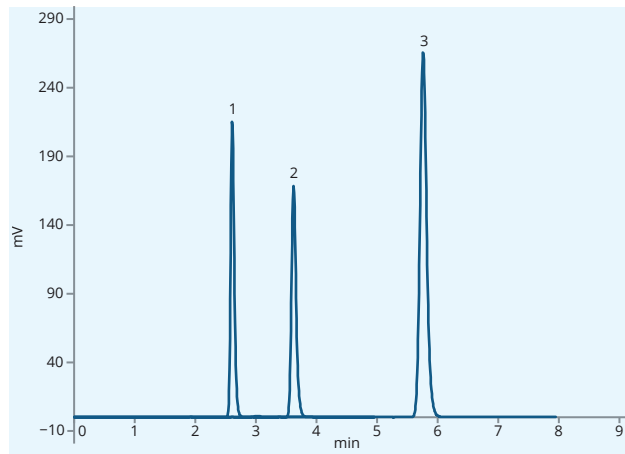


Standard on ASTRA® C18-HE

Column	ASTRA® C18-HE, 3 µm
Dimensions	150 mm × 4.6 mm
Part number	AST-5732-IK46
Mobile phase	Acetonitrile + 0.1% formic acid : water (32 : 68 v/v) Isocratic elution
Flow rate	1.6 mL/min
Temperature	65 °C
Detection	UV @210 nm
Analytes	1. Rebaudioside D 2. Rebaudioside A 3. Stevioside

Amines

This application shows nice symmetry of various amines on ASTRA® C18-BDS.



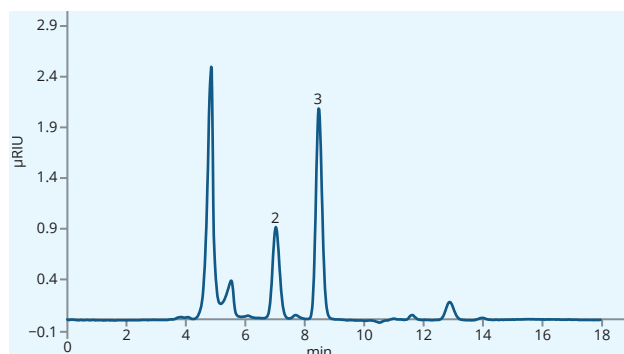
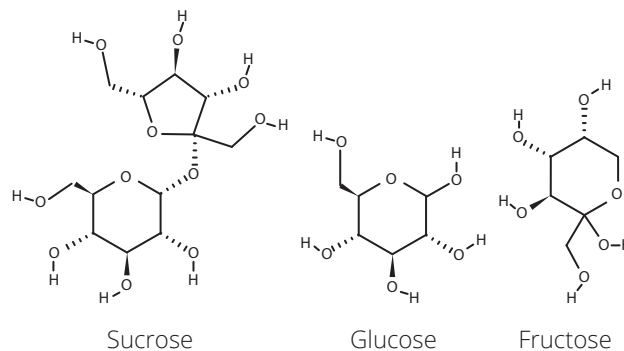
Standard on ASTRA® C18-BDS

Column	ASTRA® C18-BDS 5 µm
Dimensions	150 mm × 4.6 mm
Part number	AST-5875-LK46
Mobile phase	Water:ACN (45:55)
Flow rate	1.0 mL/min
Temperature	25 °C
Injection volume	1 µL
Detection	DAD @254 nm
Analytes	1. Aniline 2. 4-Ethylaniline 3. N,N-dimethylaniline

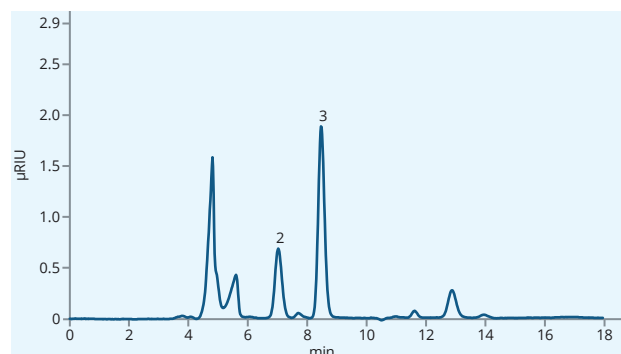
Sugars control in tomatoes and ketchups

A taste of tomato products depends on content of the main food sugars, such as sucrose, glucose and fructose. Sugars are analysed continuously during the products manufacturing at the different steps of a process. The content of sugars in tomatoes is highly dependent on the geographical origin, ripeness and transportation conditions. This application highlights the analysis of food sugars in several kinds of tomatoes and ketchups using ASTRA[®] Sugar Ca column.

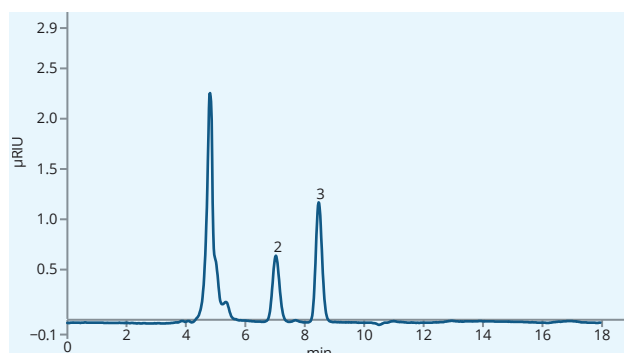
Column	ASTRA [®] Sugar Ca(S), 10 µm
Dimensions	300 mm × 8 mm
Part number	AST-5906-VN80
Mobile phase	100% H ₂ O
Flow rate	1.0 mL/min
Temperature	80 °C
Injection volume	3 µL
Detection	RID (55 °C)
Analytes	1. Sucrose 2. Glucose 3. Fructose



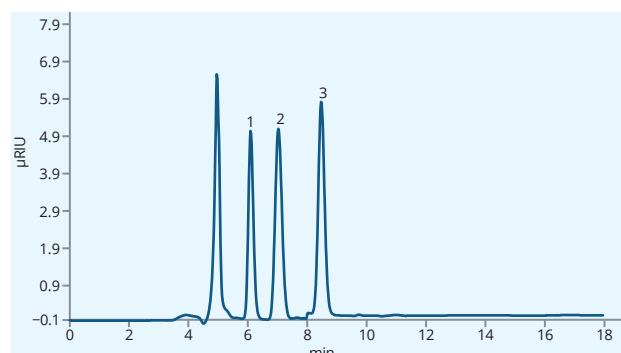
Sugars profile in small red tomatoes



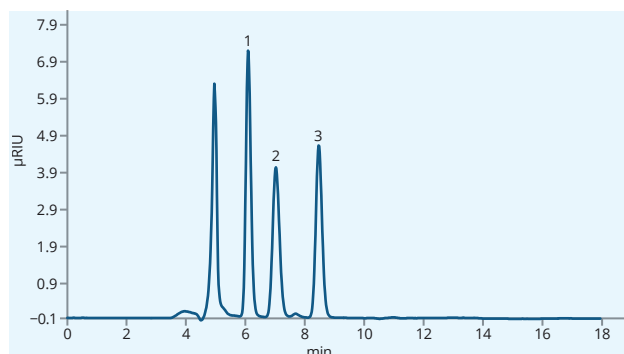
Sugars profile in big red tomatoes



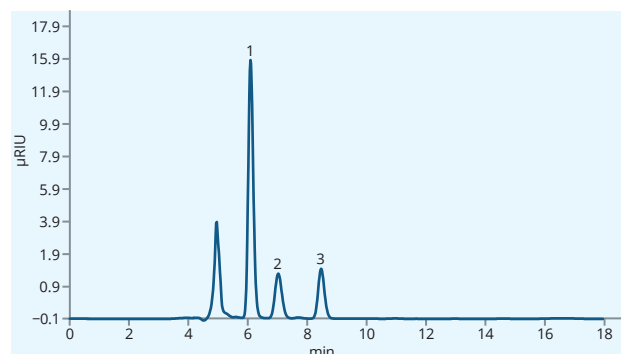
Sugars profile in small orange tomatoes



Sugars profile in ketchup Hame spicy



Sugars profile in ketchup Hame sweet



Sugars profile in ketchup Hellmann's delicate

Ordering information

Analytical columns

2 µm ASTRA® all dimensions in mm						AGS Guard System
Phase	30 × 2.1	50 × 2.1	75 × 2.1	100 × 2.1	150 × 2.1	2.1 mm Cartridges
C18-HE	On request	AST-5732-TG21	On request	AST-5732-TI21	AST-5732-TK21	AGS-5731-RB2*
C18-AQ	On request	On request	On request	AST-5832-TI21	AST-5832-TK21	AGS-5731-RB2*

3 µm ASTRA® all dimensions in mm					AGS Guard System
Phase	50 × 2.1	75 × 2.1	100 × 2.1	150 × 2.1	2.1 mm Cartridges
C18-HE	On request	AST-5732-IH21	AST-5732-II21	AST-5732-IK21	AGS-5731-RC2*
C18-AQ	On request	AST-5832-IH21	AST-5832-II21	AST-5832-IK21	AGS-5731-RC2*
C18-BDS	On request	On request	On request	AST-5875-IK21	AGS-5731-RC2*
Phenyl-Hexyl HE	On request	On request	AST-5891-II21	AST-5891-IK21	AGS-5731-RC2*
DM	On request	On request	AST-5810-II21	AST-5810-IK21	AGS-5731-RC2*
Diol	On request	On request	AST-5858-II21	AST-5858-IK21	On request
Si	On request	On request	On request	AST-5905-IK21	On request

3 µm ASTRA® all dimensions in mm				AGS Guard System
Phase	50 × 3.0	100 × 3.0	150 × 3.0	2.1 mm Cartridges
C18-HE	AST-5732-IG30	AST-5732-II30	AST-5732-IK30	AGS-5731-RC2*
C18-AQ	AST-5832-IG30	AST-5832-II30	AST-5832-IK30	AGS-5731-RC2*
C18-BDS	On request	On request	AST-5875-IK30	AGS-5731-RC2*
Phenyl-Hexyl HE	On request	AST-5891-II30	On request	AGS-5731-RC2*
DM	On request	AST-5810-II30	AST-5810-IK30	AGS-5731-RC2*
Diol	On request	On request	AST-5858-IK30	On request

3 µm ASTRA® all dimensions in mm					AGS Guard System
Phase	50 × 4.6	100 × 4.6	150 × 4.6	250 × 4.6	4.0 mm Cartridges
C18-HE	AST-5732-IG46	AST-5732-II46	AST-5732-IK46	AST-5732-IM46	AGS-5731-RC4*
C18-AQ	On request	AST-5832-II46	AST-5832-IK46	AST-5832-IM46	AGS-5731-RC4*
C18-BDS	On request	AST-5875-II46	AST-5875-IK46	On request	AGS-5731-RC4*
C8-HE	On request	On request	AST-5896-IK46	On request	AGS-5731-RC4*
Phenyl-Hexyl HE	On request	On request	AST-5891-IK46	On request	AGS-5731-RC4*
DM	On request	AST-5810-II46	AST-5810-IK46	On request	AGS-5731-RC4*
Diol	On request	On request	AST-5858-IK46	AST-5858-IM46	On request

5 µm ASTRA® all dimensions in mm						AGS Guard System
Phase	30 × 2.1	50 × 2.1	50 × 3.0	100 × 3.0	150 × 3.0	2.1 mm Cartridges
C18-HE	AST-5732-LD21	AST-5732-LG21	AST-5732-LG30	AST-5732-LI30	AST-5732-LK30	AGS-5731-RD2*
C18-AQ	AST-5832-LD21	AST-5832-LG21	On request	AST-5832-LI30	AST-5832-LK30	AGS-5731-RD2*
C18-BDS	On request	On request	On request	AST-5875-LI30	AST-5875-LK30	AGS-5731-RD2*
C8-BDS	On request	On request	On request	AST-5895-LI30	On request	AGS-5731-RD2*
Phenyl-Hexyl HE	On request	On request	On request	On request	On request	AGS-5731-RD2*
DM	On request	AST-5810-LG21	On request	AST-5810-LI30	AST-5810-LK30	AGS-5731-RD2*
Diol	On request	On request	On request	AST-5858-LI30	On request	On request

* AGS Guard System cartridges require AGS Holder (p/n AGS-5731-000). The holder is supplied with a stainless steel ferrule. Use AGS-5731-RD2 for 2.1 mm ID columns. For applications up to 400 bar, the PEEK ferrule is recommended for use (p/n AGS-5731-Y00).

Ordering information

Analytical columns

5 µm ASTRA® all dimensions in mm		AGS Guard System
Phase	250 × 4.0	4.0 mm Cartridges
C18-HE	On request	AGS-5790-RD4*
C18-AQ	On request	AGS-5790-RD4*
C18-BDS	AST-5875-LM40	AGS-5790-RD4*
C8-HE	AST-5896-LM40	AGS-5790-RD4*
C8-BDS	AST-5895-LM40	AGS-5790-RD4*
Phenyl-Hexyl HE	On request	AGS-5790-RD4*
DM	On request	AGS-5790-RD4*
Diol	On request	On request
Si	AST-5905-LM40	AGS-5731-ND4*

5 µm ASTRA® all dimensions in mm						AGS Guard System
Phase	30 × 4.6	50 × 4.6	100 × 4.6	150 × 4.6	250 × 4.6	4.0 mm Cartridges
C18-HE	AST-5732-LD46	On request	AST-5732-LI46	AST-5732-LK46	AST-5732-LM46	AGS-5790-RD4*
C18-AQ	On request	On request	AST-5832-LI46	AST-5832-LK46	AST-5832-LM46	AGS-5790-RD4*
C18-BDS	On request	On request	AST-5875-LI46	AST-5875-LK46	AST-5875-LM46	AGS-5790-RD4*
C8-HE	On request	On request	On request	AST-5896-LK46	AST-5896-LM46	AGS-5790-RD4*
C8-BDS	On request	On request	On request	AST-5895-LK46	AST-5895-LM46	AGS-5790-RD4*
Phenyl-Hexyl HE	On request	On request	AST-5891-LI46	AST-5891-LK46	AST-5891-LM46	AGS-5790-RD4*
DM	On request	On request	AST-5810-LI46	AST-5810-LK46	AST-5810-LM46	AGS-5790-RD4*
Diol	On request	On request	On request	AST-5858-LK46	AST-5858-LM46	On request
Si	On request	On request	On request	On request	AST-5905-LM46	AGS-5731-ND4*

* AGS Guard System cartridges require AGS Holder (p/n AGS-5731-000). The holder is supplied with a stainless steel ferrule. Use AGS-5731-RD2 for 2.1 mm ID columns. For applications up to 400 bar, the PEEK ferrule is recommended for use (p/n AGS-5731-Y00).

9 µm ASTRA® all dimensions in mm		Guard column
Phase	300 × 8.0	30 × 8.0
Sugar Ca (S)	AST-5906-WN80	AGS-5906-IFC
Sugar H (S)	On request	AGS-5906-JFC

10 µm ASTRA® all dimensions in mm		Guard column
Phase	300 × 8.0	30 × 8.0
Sugar Ca (S)	AST-5906-VN80	AGS-5906-IFC
Sugar H (S)	AST-5927-VN80	AGS-5906-JFC
Sugar K (S)	On request	On request
Sugar Na (S)	On request	On request

10 µm ASTRA® all dimensions in mm		
Phase	30 × 2.1	250 × 4.6
C18-HE	AST-5832-PD21	AST-5732-PM46
C18-AQ	On request	



ASTRA® Sugar guard column