

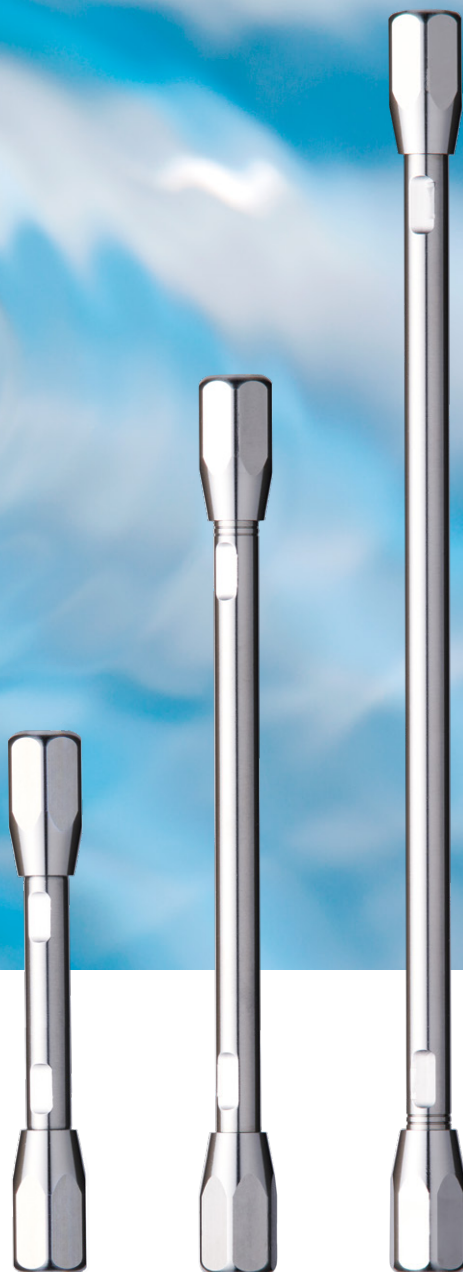
HPLC, LC/MS Columns

Inertsil Hybrid-C18

High-pH Tolerant HPLC Column for Robust and Reproducible Performance



**Built for Basic Conditions.
Trusted for Every Run.**



Introduction & Key Features

Inertsil Hybrid-C18 is a silica-based reversed-phase column engineered with hybrid organic-inorganic bonding technology, enabling exceptional chemical stability across a broad pH range of 1–12.

- pH range 1–12 for both acidic and basic conditions
- Excellent batch-to-batch reproducibility
- Compatible with LC/MS, LC/MS/MS and high-pressure LC systems
- High durability and long lifetime, even under basic pH
- USP L1 classification (C18)

Specification

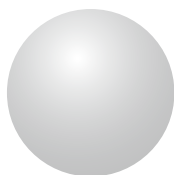
Base Material	: High-pH Stable Hybrid Silica
Particle Size	: 1.7 μm / 3.5 μm / 5 μm
Pore Size	: 165 Å (16.5 nm)
Pore Volume	: 1.00 mL/g
Surface Area	: 185 m ² /g
Carbon Load	: 15%
End-capped	: Yes
USP Code	: L1
Max Temp	: 80°C (pH 1 - 10), 60°C (pH 1 - 12)
pH Range	: 1 – 12
Max Pressure	1.7 μm : 18,000 psi (124 MPa) — PEEK hardware: 14,500 psi (100 MPa) 3.5 μm : 7,200 psi (50 MPa) 5 μm : 6,000 psi (40 MPa)

A Legacy of Quality

Since the launch of Inertsil ODS-3 in 1994, we have consistently manufactured HPLC columns in-house—from the synthesis of base silica to final packing. This fully integrated production process is the foundation of our ability to deliver high-quality, highly reliable columns with unmatched consistency.

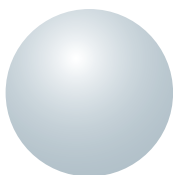
Inertsil Hybrid-C18 was newly developed to meet the evolving needs of users, offering exceptional durability under high-pH mobile phase conditions. This column expands application flexibility while maintaining the trusted performance of the Inertsil series.

Classic Silica



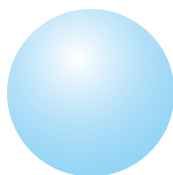
Inertsil ODS
Inertsil ODS-2

High-Purity Silica



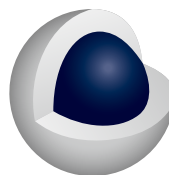
Inertsil ODS-3
Inertsil C8-3
Inertsil Ph-3
Inertsil ODS-4
Inertsil ODS-HL

ES Silica



InertSustain

Core-Shell



InertCore

Hybrid Silica



Inertsil Hybrid-C18

One Column, Infinite Possibilities

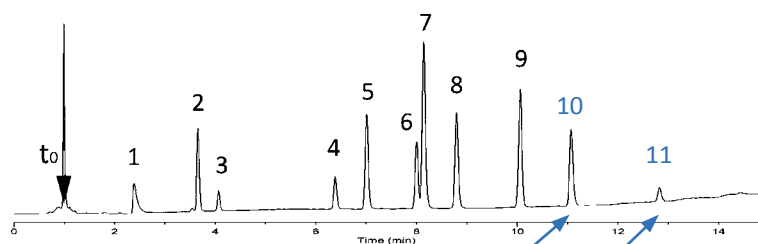
Impact of Mobile Phase pH on Selectivity

These chromatograms demonstrate how changes in mobile phase pH influence the selectivity and resolution of analytes.

Inertsil Hybrid-C18 of hybrid silica gel allows stable performance across this wide pH range without loss of efficiency and reproducibility.

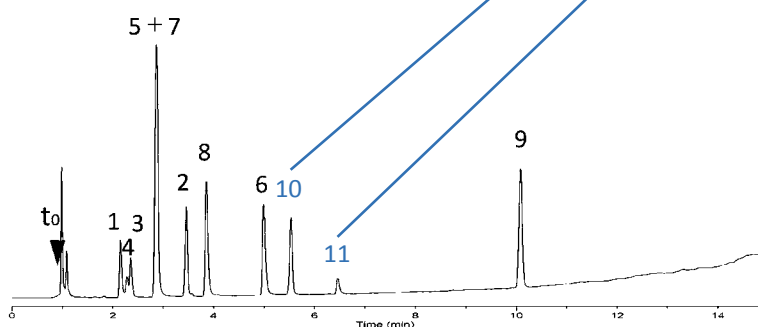
pH 9.8

10 mM HCOONH₄
50 mM NH₃



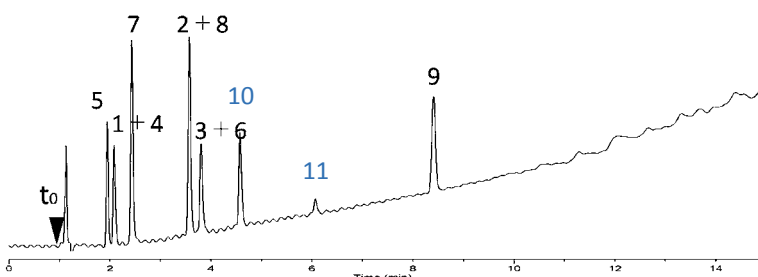
pH 6.5

10 mM HCOONH₄



pH 4.8

10 mM HCOONH₄
0.1% HCOOH



- **Basic compounds (pK_a ≈ 9)** show stronger retention at high pH due to reduced ionization.
- **Acidic compounds (e.g., COOH)** retain better at low pH where ionization is suppressed.
- **Understanding pK_a** enables control over separation behavior.

No.	Compound
1	Epinastine
2	Cetirizine
3	Fexofenadine
4	Chlorpheniramine
5	Ketotifen
6	Hydroxyzine
7	Triprolidine
8	Azelastine
9	Loratadine
10	Homochlorcyclizine
11	Clemastine

Alkali-Resistant Hybrid Silica Technology

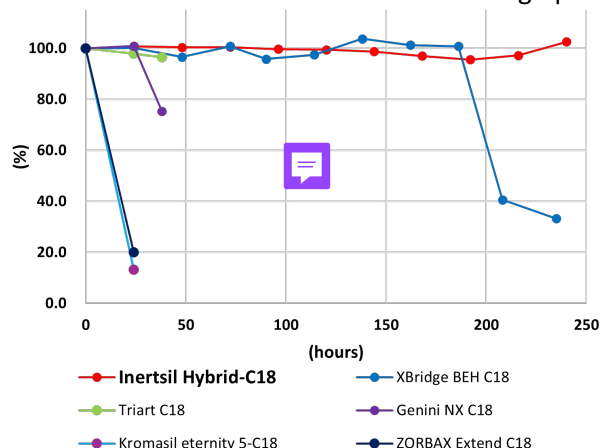
Superior Durability Under High pH Conditions (pH 11.5)

With its advanced hybrid silica technology, Inertsil Hybrid-C18 delivers exceptional resistance to alkaline mobile phase condition.

Even under high-pH mobile phase conditions that typically cause dissolution of conventional packings, the column maintains its structural integrity.

This unique robustness prevents loss of theoretical plates, guaranteeing reliable peak resolution, reproducible separations, and extended column lifetime.

Consistent Theoretical Plate Count at High pH



Mobile phase for durability testing

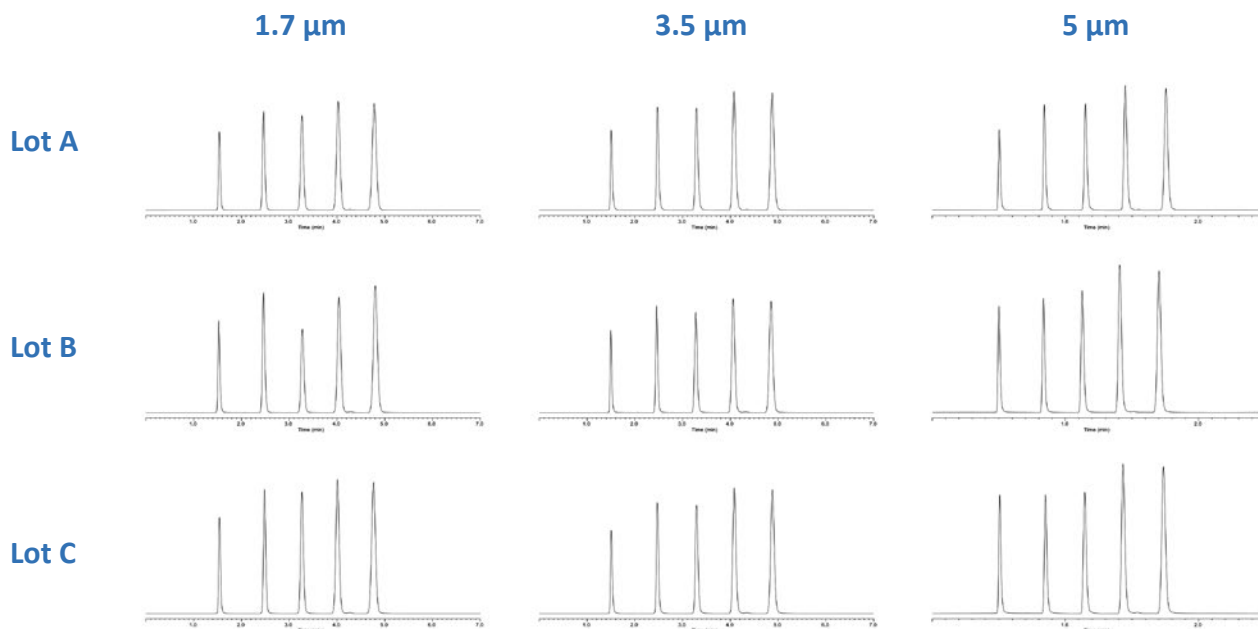
Column : 5 μ m, 150 x 2.1 mm I.D.
 Eluent : A) 50 mM Phosphate Buffer (pH 11.5) in H₂O
 : B) CH₃CN
 : A/B = 90/10, v/v
 Flow Rate : 0.2 mL/min
 Col. Temp. : 40 °C

Mobile phase for analysis

Eluent : A) H₂O
 : B) CH₃CN
 : A/B = 35/65, v/v
 Flow Rate : 0.2 mL/min
 Col. Temp. : 40 °C
 Detection : 254 nm
 Sample : Naphthalene

Excellent batch-to-batch reproducibility

Comparison of three different production lots of Inertsil Hybrid-C18 show virtually identical retention and peak shape, demonstrating outstanding lot-to-lot consistency. This high reproducibility ensures method robustness and eliminates the need for revalidation when switching lots.

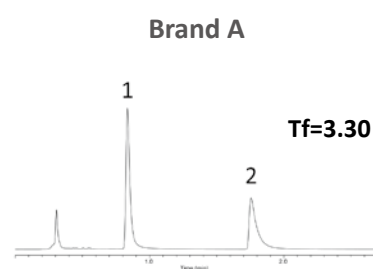
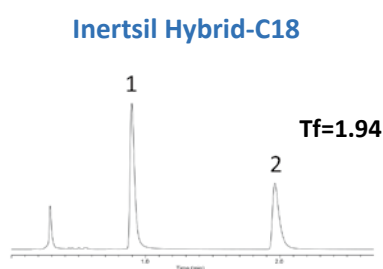


Superior Performance Across Challenging Analytes with Inertsil Hybrid-C18

Inertsil Hybrid-C18 demonstrates excellent peak shape for basic compounds, acidic compounds, and metal-coordinating compounds, outperforming competitor columns. This high-level performance is achieved through our proprietary hybrid silica technology, which offers superior resistance to peak tailing and adsorption issues under a wide range of pH conditions.

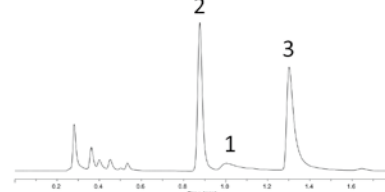
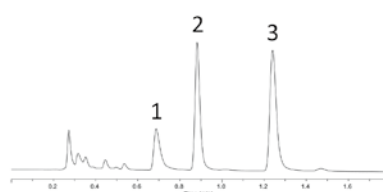
Basic Compounds

Conditions
 Column : Inertsil Hybrid-C18, 1.7 μ m, 50 x 2.1 mm I.D.
 Eluent : A) 25 mM Phosphate Buffer (pH7.0) in H₂O
 B) CH₃CN
 A/B = 70/30, v/v
 Flow Rate : 1.7 μ m, 2.1 x 50 mm, 0.4 mL/min
 Col. Temp. : 40 °C
 Detection : UV 230 nm
 Analytes : 1. Berberine
 2. Dextromethorphan



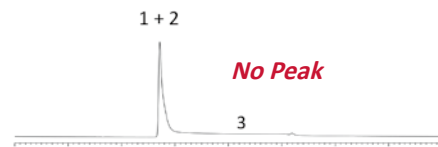
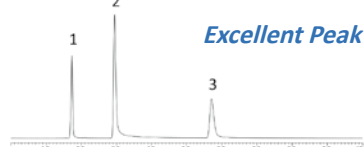
Acid Compounds

Conditions
 Column : Inertsil Hybrid-C18, 1.7 μ m, 50 x 2.1 mm I.D.
 Eluent : A) CH₃CN
 B) 0.1% H₃PO₄ in H₂O
 A/B = 25/75, v/v
 Flow Rate : 1.7 μ m, 2.1 x 50 mm : 0.4 mL/min
 Col. Temp. : 40 °C
 Detection : UV 254 nm
 Analytes : 1. Blue FCF
 2. Phenol
 3. Salicylic acid



Metal-coordinating Compounds

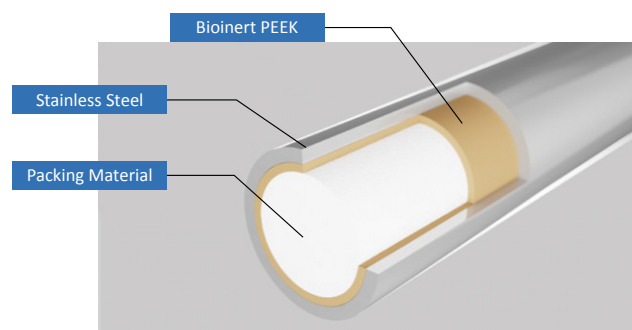
Conditions
 Column : Inertsil Hybrid-C18, 1.7 μ m, 50 x 2.1 mm I.D.
 Eluent : A) CH₃CN, B) 0.1 % formic acid
 A/B = 60/40, v/v
 Flow Rate : 0.2 mL/min
 Col. Temp. : 40 °C
 Detection : UV 310 nm
 Inj. Vol. : 1 μ L
 Analytes : 1. 8-Quinololinol
 2. Hinokitiol
 3. Picrotone Olamine



Column Hardware Lineup

Wide Range of Dimensions and Hardware Options

Hardware is available in two choices: stainless steel (SS) and biocompatible PEEK, making it suitable for everything from routine analyses to LC/MS, LC/MS/MS, and sensitive biological applications.



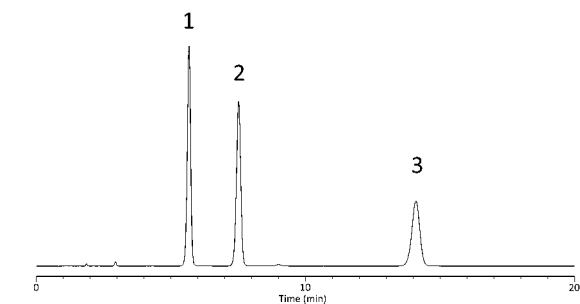
Customized Dimensions Available on Request

In addition to our standard lineup, custom column dimensions and configurations can be made to order, including preparative-scale dimensions and specialty hardware options.



Application

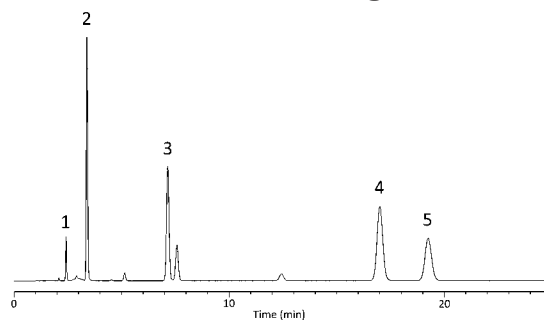
Guanine-based antiviral agent



Conditions

Column : 5 μ m, 150 x 2.1 mm I.D.
 Eluent : 10 mM HCOONH₄ in H₂O
 Flow Rate : 0.3 mL/min
 Col. Temp. : 40 °C
 Detection : UV 254 nm
 Inj. Vol. : 1 μ L
 Analytes : 1. Ganciclovir
 2. Aciclovir
 3. Penciclovir
 (100 mg/L each)

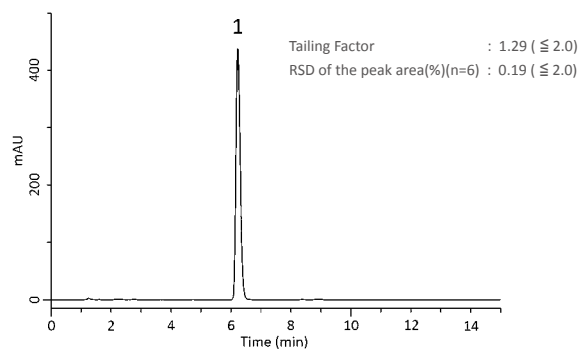
Nucleoside-based antiviral drug



Conditions

Column : 3.5 μ m, 150 x 2.1 mm I.D.
 Eluent : 10 mM HCOONH₄ in H₂O
 Flow Rate : 0.3 mL/min
 Col. Temp. : 40 °C
 Detection : UV 240 nm
 Inj. Vol. : 1 μ L
 Analytes : 1. Ribavirin
 2. Cytarabine
 3. Gemcitabine
 4. Lamivudine
 5. Vidarabine
 (100 mg/L each)

Azithromycin Tablet of Assay under USP condition

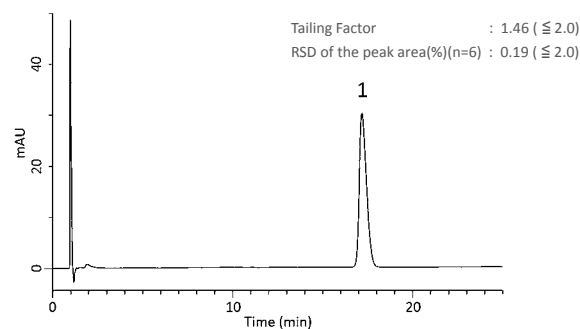


Conditions

Column : 5 μ m, 250 x 4.6 mm I.D.
 Eluent : CH₃CN/Buffer* = 65/35, v/v
 Flow Rate : 2.0 mL/min
 Col. Temp. : 50 °C
 Detection : UV 210 nm
 Inj. Vol. : 100 μ L
 Analyte : Reference Standard in Eluent
 1. Azithromycin dihydrate 1 mg/mL

*Dissolve 4.6 g of monobasic potassium phosphate anhydrous in 900 mL of water. Adjust with 1 N sodium hydroxide to a pH of 7.5, and dilute with water to 1 L.

Azithromycin Tablet of Dissolution under USP condition

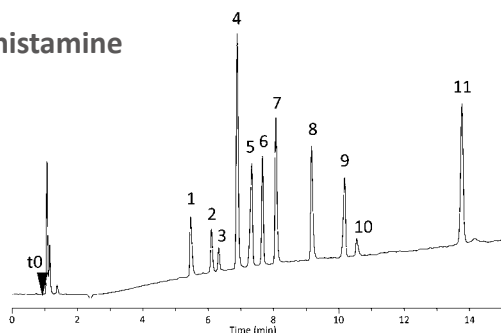


Conditions

Column : 5 μ m, 150 x 4.6 mm I.D.
 Eluent : CH₃CN/CH₃OH/Solution* = 9/3/8, v/v/v
 Flow Rate : 1.5 mL/min
 Col. Temp. : 50 °C
 Detection : UV 210 nm
 Inj. Vol. : 50 μ L
 Sample : Reference Standard
 1. Azithromycin dihydrate 0.25 mg/mL

*4.4 mg/mL of dibasic potassium phosphate and 0.5 mg/mL of sodium 1-octanesulfonate; adjusted with phosphoric acid to a p of 8.20 $\pm$ 0.05.

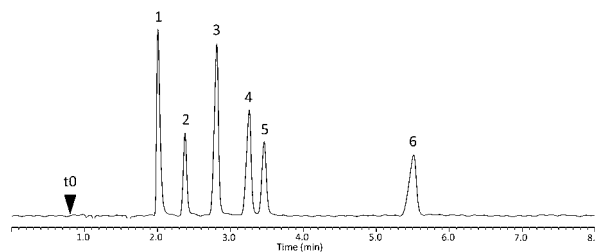
Antihistamine



Conditions

Column : 3.5 μ m, 150 x 2.1 mm I.D.
 Eluent : A) 10 mM HCOONH₄ in H₂O
 B) CH₃CN
 A/B = 80/20 - 15 min - 20/80 - 0.1 min - 80/20, v/v
 Flow Rate : 0.3 mL/min
 Col. Temp. : 40 °C
 Detection : UV 240 nm
 Inj. Vol. : 2 μ L
 Analytes : 1. Epinastine
 2. Chlorpheniramine
 3. Fexofenadine
 4. Triprolidine
 5. Ketotifen
 7. Azelastine
 8. Hydroxyzine
 9. Homochlorcyclizine
 10. Clemastine
 11. Loratadine
 (50 mg/L each)

Antidepressant



Conditions

Column : 3.5 μ m, 150 x 2.1 mm I.D.
 Eluent : A) 10 mM HCOONH₄ in H₂O
 B) CH₃CN
 A/B=50/50, v/v
 Flow Rate : 0.3 mL/min
 Col. Temp. : 40 °C
 Detection : UV 230 nm
 Inj. Vol. : 1 μ L
 Analytes : 1. Nortriptyline
 2. Imipramine
 3. Amitriptyline
 4. Sertraline
 5. Clomipramine
 6. Mianseline
 (100 mg/L each)

Ordering Information

Inertsil Hybrid-C18 SS Hardware

Particle Size	Length/ID (mm)	2.1	3.0	4.6
1.7 μm	30	5020-76052	5020-76057	—
	50	5020-76053	5020-76058	—
	75	5020-76054	5020-76059	—
	100	5020-76055	5020-76060	—
	150	5020-76056	5020-76061	—
3.5 μm	30	5020-76026	5020-76032	5020-76038
	50	5020-76027	5020-76033	5020-76039
	75	5020-76028	5020-76034	5020-76040
	100	5020-76029	5020-76035	5020-76041
	150	5020-76030	5020-76036	5020-76042
	250	5020-76031	5020-76037	5020-76043
5 μm	30	5020-76000	5020-76006	5020-76012
	50	5020-76001	5020-76007	5020-76013
	75	5020-76002	5020-76008	5020-76014
	100	5020-76003	5020-76009	5020-76015
	150	5020-76004	5020-76010	5020-76016
	250	5020-76005	5020-76011	5020-76017



Inertsil Hybrid-C18 PEEK Hardware

Particle Size	Length/ID (mm)	2.1	4.6
1.7 μm	50	5020-76062	—
	100	5020-76063	—
	150	5020-76064	—
3.5 μm	50	5020-76044	5020-76048
	100	5020-76045	5020-76049
	150	5020-76046	5020-76050
	250	5020-76047	5020-76051
5 μm	50	5020-76018	5020-76022
	100	5020-76019	5020-76023
	150	5020-76020	5020-76024
	250	5020-76021	5020-76025

NeoGuard, Guard Column Cartridge and Holder

Particle Size	2.1 x 5 mm (3/pk)	3.0 x 5 mm (3/pk)	4.6 x 5 mm (3/pk)	Holder
1.7 μm	5020-76072	5020-76071	—	5020-76073
3.5 μm	5020-76070	5020-76069	5020-76068	
5 μm	5020-76067	5020-76066	5020-76065	



Replacement
Cartridge



Holder

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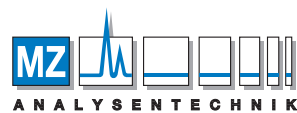
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