

# MERCURYMS™ LC/MS COLUMNS & CARTRIDGES

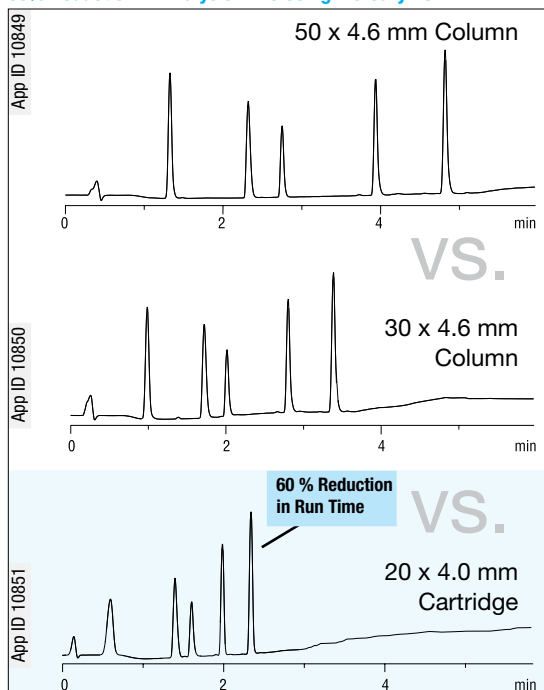
## Analytical Column Performance in Small Columns and Cartridges

- Ultra-fast, low-cost analysis for high-throughput laboratories
- Packed with Luna®, Synergi™, and Gemini® material
- Short 10 and 20 mm cartridge formats use a new proprietary slurry packing process

## Reduce Analysis Times by 60 %

With the increasing emphasis on high sample throughput for screening combinatorial libraries as well as the need for overall faster cycle time, it has become necessary for the chromatographer to reduce analysis time while still maintaining acceptable resolution. As shown, retention times can be significantly reduced with a 20 x 4.0 mm MercuryMS cartridge column.

### 60% Reduction in Analysis Time Using MercuryMS



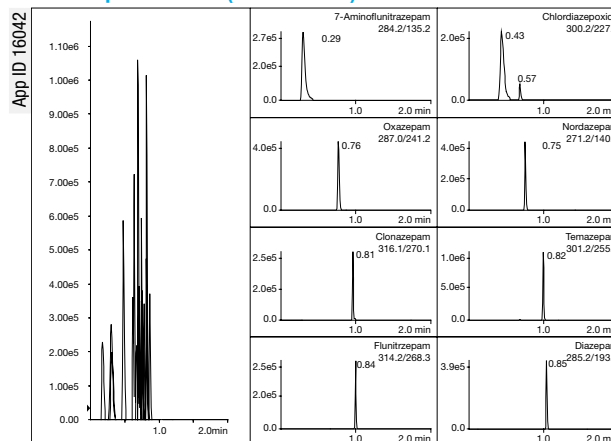
**Column:** Luna 3 µm C18(2)  
**Dimensions:** 50 x 4.6 mm, 30 x 4.6 mm, 20 x 4.0 mm  
**Mobile Phase:** A = Water with 0.1 % Formic acid  
 B = Acetonitrile w/0.1 % Formic acid  
 95:5 A/B to 5:95 in 6 min for 50 x 4.6 mm  
 95:5 A/B to 5:95 in 4 min for 30 x 4.6 mm  
 95:5 A/B to 5:95 in 2.4 min for 20 x 4.0 mm  
**Flow Rate:** 2 mL/min for 50 and 30 x 4.6 mm,  
 1.6 mL/min for 20 x 4.0 mm  
**Detection:** UV @ 254 nm  
**Temperature:** Ambient  
**Sample:** 5 µL Gradient mixture  
 1. Acetaminophen  
 2. Propranolol  
 3. Imipramine  
 4. Naproxen  
 5. Valerophenone

Format	Speed	Sensitivity	Efficiency	Selectivity
MercuryMS Columns and Cartridges	Fastest Run Time	Good	High	Most phases available
High Speed Technology (HST) Columns	Fast Run Time	Excellent	Highest	Several phases available
Monolith and Particle-Based Capillary Columns	Fast Loading	Excellent	High	Most phases available

Luna and Gemini are registered trademarks of Phenomenex, Inc.  
 Synergi is a trademark of Phenomenex, Inc.

## Retain Polar Compounds in Less than 1 Minute!

### Benzodiazepines in Urine (LC/MS/MS - 2)



**Column:** Synergi 2.5 µm Fusion-RP MercuryMS™ 10 x 2.0 mm cartridge  
**Gradient:** 15:85 to 95:5 B in 1.0 min, re-equilibration for 1.0 min (2.0 min cycle)  
**Injection:** 10 µL of 100 ng/mL Benzodiazepines in urine after SPE clean-up  
**Flow Rate:** 0.6 mL/min

*†Full method, recovery and RSD data available, please request Technical Note: TN-1030, High Speed LC/MS Analysis with MercuryMS Cartridges for High-Throughput Drug Discovery.*

**i** Increasing the flow rate can further reduce analysis time. MercuryMS cartridges are designed to handle the increased linear velocities associated with high-throughput gradient chromatography. However, the following operating limitations should be observed:

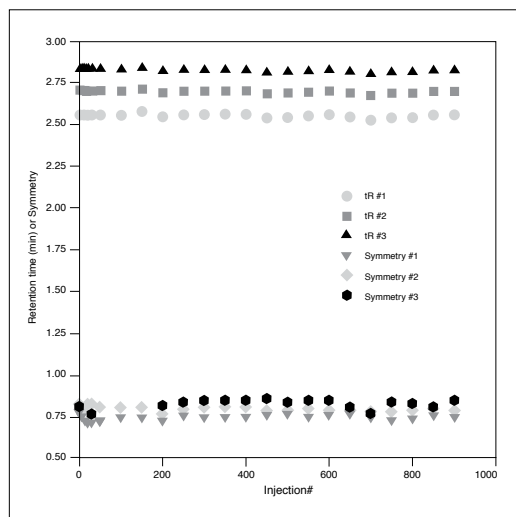
Max Pressure:	5000 psi (344 bar)
Max Flow:	2.0 mm ID: 1.2 mL/min 4.0 mm ID: 4 mL/min

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## Rugged Durability for Over 1,000 Injections

When running long sequences, often involving hundreds of valuable samples, it is imperative that the column not fail during the middle of the run. As shown, the LUNA 3 µm C18(2) 20 x 2.0 mm MercuryMS cartridge was stable for over 1000 injections (over 20,000 column volumes of mobile phase) in this gradient assay, offering exceptional reliability for automated screening systems.

### MercuryMS: Stable Over 1,000 Injections



**Column:** LUNA 3 µm C18(2) 20 x 2.0 mm MercuryMS Cartridge  
**Part No.:** 00M-4251-B0-CE  
**Mobile Phase:** A= Water with 0.1 % Trifluoroacetic acid (TFA)  
B= Methanol with 0.1 % TFA  
**Gradient:** 95:5 A/B to 5:95 A/B in 2 min at a flow rate of 0.4 mL/min, then reequilibrate for 3 min at 1.0 mL/min  
**Flow Rate:** 0.4 and 1.0 mL/min  
**Detection:** UV @ 230 nm  
**Temperature:** Ambient  
**Sample:** 2 µL containing:  
1. Propranolol  
2. Metoprolol  
3. Pindolol



## Selecting a Phase to Maximize LC/MS Sensitivity

Gemini, Synergi and Luna medias offer a range of hydrophobicities, polar selectivity and chemical stability needed to resolve complex sample mixtures as well as improve LC/MS results. Highly hydrophobic phases can increase LC/MS sensitivity as they allow analyte elution at higher organic concentrations. The ionization of analytes, and the accompanying MS signal, are enhanced when the analytes are eluted from the column and introduced to the MS in eluents high in organic (methanol, acetonitrile) content.

The wide pH stability of Gemini, Synergi Max-RP, Synergi Fusion-RP and Luna media afford flexibility when working with analytes above a pKa of 9. For these compounds, LC/MS users are exploring the use of high-pH mobile phases using ammonium hydroxide (pH 10). While this will suppress the generation of positive ions of basic compounds, it can facilitate the formation of negative ions by stripping protons from hydroxyl, carboxyl, or other functional groups. Thus, for analyses of acidic or hydroxyl-containing compounds, the use of ammonium hydroxide will facilitate monitoring in negative-ion mode.

### Hydrophobicity Scale for MercuryMS Phases

#### High

- ▶ **Synergi Hydro-RP**  
A polar-endcapped C18 that offers extreme retention of hydrophobic and hydrophilic pH stable 1.5-7.0 compounds. (2.5 µm, 4 µm)
- ▶ **Luna C18(2)**  
Our most popular C18 material with high hydrophobic retention and exceptional 1.5 to 10 pH stability. (2.5 µm, 3 µm, 5 µm)
- ▶ **Synergi Max-RP**  
(C12 with TMS endcapping) - Gives excellent peak shape for basic analytes, particularly at neutral pH, and is intended to be used with a variety of MS-compatible mobile phase modifiers such as TFA, formic acid, or acetic acid. pH stable from 1.5 to 10. (2.5 µm, 4 µm)
- ▶ **Gemini C18**  
TWIN™ Technology combines the best of silica and polymers for wide pH stability (pH 1-12) and high efficiency. Exceptional retention and peak shape of basic compounds. (3 µm, 5 µm)

- ▶ **Synergi Fusion-RP**  
A polar embedded C18 that offers a balanced approach in separation of non-polar to polar compounds. pH stable from 1.5 to 10. (2.5 µm, 4 µm)

- ▶ **Luna C8(2)**  
A mid-range phase that is an excellent starting point for the method development of complex mixtures. pH stable from 1.5 to 10. (3 µm, 5 µm)

- ▶ **Gemini C6-Phenyl**  
pH stable 1-12 Twin™ Technology allows for a more inert, reproducible phenyl phase. Mixed-mode hydrophobic and aromatic interactions makes this an excellent phase for polar metabolites. (3 µm, 5 µm)

#### Low

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## Cartridges and Columns

### ORDERING INFORMATION

Cartridges (mm)		Columns (mm)					
		10 x 2.0	10 x 4.0	20 x 2.0	20 x 4.0	20 x 2.0	20 x 4.0
<b>Qty Pricing</b>							
<b>2.5 µm</b>	<b>Phase</b>						
Synergi	Hydro-RP*	00N-4387-B0-CE	00N-4387-D0-CE	00M-4387-B0-CE	00M-4387-D0-CE	00M-4387-B0	00M-4387-D0
Synergi	Max-RP*	00N-4372-B0-CE	00N-4372-D0-CE	00M-4372-B0-CE	00M-4372-D0-CE	00M-4372-B0	00M-4372-D0
Synergi	Fusion-RP*	00N-4423-B0-CE	00N-4423-D0-CE	00M-4423-B0-CE	00M-4423-D0-CE	00M-4423-B0	00M-4423-D0
Synergi	Polar-RP*	—	00N-4371-D0-CE	00M-4371-B0-CE	00M-4371-D0-CE	00M-4371-B0	00M-4371-D0
<b>3 µm</b>							
Luna	C18(2)	00N-4251-B0-CE	00N-4251-D0-CE	00M-4251-B0-CE	00M-4251-D0-CE	00M-4251-B0	00M-4251-D0
Luna	C8(2)	00N-4248-B0-CE	00N-4248-D0-CE	00M-4248-B0-CE	00M-4248-D0-CE	00M-4248-B0	00M-4248-D0
Gemini	C6-Phenyl	00N-4443-B0-CE	00N-4443-D0-CE	00M-4443-B0-CE	00M-4443-D0-CE	00M-4443-B0	00M-4443-D0
Gemini	C18	Inquire	Inquire	00M-4439-B0-CE	00M-4439-D0-CE	00M-4439-B0	00M-4439-D0
<b>5 µm</b>							
Luna	C18(2)	00N-4252-B0-CE	00N-4252-D0-CE	00M-4252-B0-CE	00M-4252-D0-CE	—	—
Luna	C8(2)	00N-4249-B0-CE	00N-4249-D0-CE	00M-4249-B0-CE	00M-4249-D0-CE	—	—
Gemini	C18	—	—	00M-4435-B0-CE	00M-4435-D0-CE	—	—

\* 4 µm Synergi materials available upon request.

## Cartridge Holders



Direct-Connect Holder



Standard Holder

### ORDERING INFORMATION

Standard Cartridge Holders		
Part No.	Description	Price
CH0-5846	10 mm standard holder	
CH0-5845	20 mm standard holder	
Direct-Connect Cartridge Holders		
Part No.	Description	Price
CH0-7187	10 mm direct-connect holder	
CH0-7188	20 mm direct-connect holder	

## Screening Kits

These convenient screening kits allow quick, easy and economical evaluation of multiple phases. Each kit contains one cartridge of each available phase and a standard holder. Available in either 3 µm or 5 µm Luna with 2.5 µm Synergi.



### ORDERING INFORMATION

Screening Kits	20 x 2.0 mm Kit	20 x 4.0 mm Kit
Kit A includes 1 ea of: Luna 3 µm C18(2) Cartridge Luna 3 µm C8(2) Cartridge Synergi 2.5 µm Max-RP Cartridge Synergi 2.5 µm Hydro-RP Cartridge 20 mm Standard Cartridge Holder	KH0-7333	KH0-7334
Kit B includes 1 ea of: Luna 5 µm C18(2) Cartridge Luna 5 µm C8(2) Cartridge Synergi 2.5 µm Max-RP Cartridge Synergi 2.5 µm Hydro-RP Cartridge 20 mm Standard Cartridge Holder	KH0-7335	KH0-7336

## Tubing/Fittings



Due to the small internal volumes of MercuryMS cartridges and the small peak volumes generated, dead volume from extraneous tubing or unions will have deleterious effects on peak shapes and efficiencies. Therefore, it is advisable to minimize excessive tubing and to use small ID (0.007") tubing to connect the column to the system, especially when using 2.0 mm ID cartridges.

### ORDERING INFORMATION

Tubing and Fittings			
Part No.	Description	Unit	Price
AT0-1260	5', 1/16" OD, 0.007" ID, PEEK Tubing	ea	
AQ0-1389	PEEK Sure-Lok Male Nut	10/pk	