

# (U)HPLC columns for polar analytes

**YMC**  
EUROPE GMBH

*The Selectivity Company*

YMC-Triart C18 for 100% aqueous conditions



## Universal

2 columns in 1:  
C18 phase with  
AQ compatibility

## Flexible

UHPLC ↔ HPLC  
pH = 1 - 12  
Temp. up to 70°C

## Robust

Reproducible  
results  
Long column  
lifetimes

[www.ymc.de](http://www.ymc.de)

20

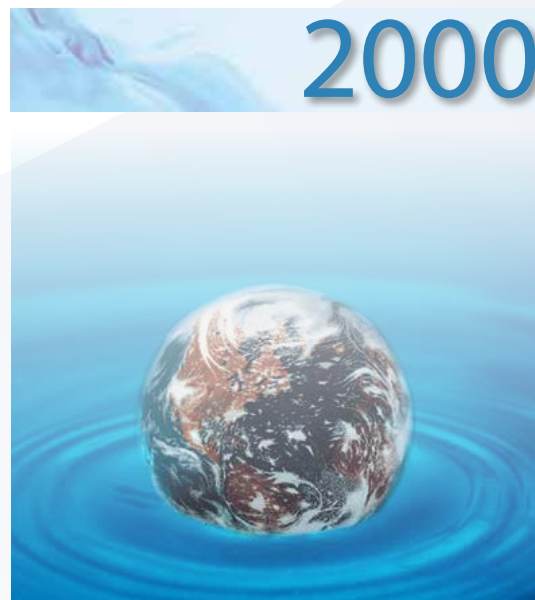
## General

The use of 100% water eluent has been a challenge in HPLC analysis for decades. Even today, many C18 materials suffer from unacceptable short lifetime, because the ligands collapse and this reduces the separation performance drastically. As a pioneer in this field, YMC has offered a product as early as the 80's, which presents a synonym for stability under aqueous conditions:

**YMC-Pack ODS-AQ.**

"AQ"-type phases are particularly suitable for the separation of polar substances, metabolites, pesticides, degradation products and peptides including protein digests.

2000

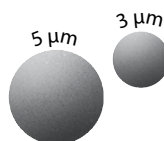


1985



## YMC-Pack ODS-AQ

- "hydrophilic" C18
- balanced surface chemistry
- polar recognition
- metabolite recognition



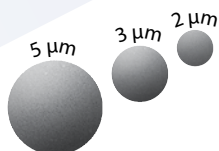
2013



## Hydrosphere C18

A new, ultrapure silica base was introduced whilst adapting the surface chemistry to maintain the „AQ“-type properties.

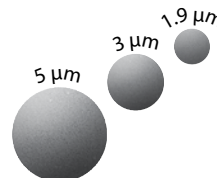
- “hydrophilic” C18 surface for enhanced polar recognition
- stable when used with 100% aqueous eluent
- no need for ion pair reagents
- addition of 2  $\mu\text{m}$  particle size for Fast-LC (YMC-Pack UltraHT)



## YMC-Triart "AQ"

The latest YMC technology platform consists of a “hybrid-style” substrate with enhanced stability against

- pH 1-12
- temp. up to 70°C
- 100% H<sub>2</sub>O



Therefore, YMC-Triart provides freedom in method development, robustness and enhanced column lifetimes for reproducible results, day after day, year after year. YMC-Triart is fully scalable within (U)HPLC  $\leftrightarrow$  HPLC with its 1.9 – 3 – 5 micron particle sizes in order to facilitate lab-to-lab method transfer.

4

**YMC-Triart C18**  
**state of the art**  
**= for polar analytes**  
**even under**  
**(U)HPLC-conditions**

- pH-stable 1-12
- stable at temperatures up to 70°C
- stable in 100% H<sub>2</sub>O eluents

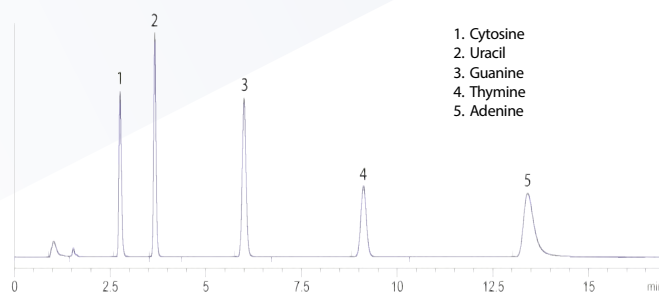
2000



1985



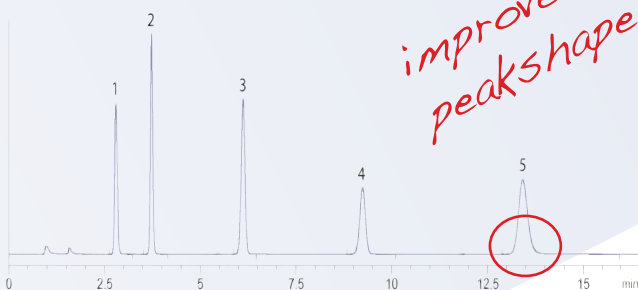
**YMC-Pack ODS-AQ**



Column: YMC-Pack ODS-AQ, (5 µm, 12 nm) 150 x 4.6 mm ID  
 Part-No.: AQ12S05-1546WT  
 Eluent: 20 mM KH<sub>2</sub>PO<sub>4</sub>-K<sub>2</sub>HPO<sub>4</sub> (pH 6.9)  
 Flow rate: 1.0 ml/min  
 Temperature: 37°C  
 Injection: 5 µl  
 Detection: UV at 254 nm



## Hydrosphere C18

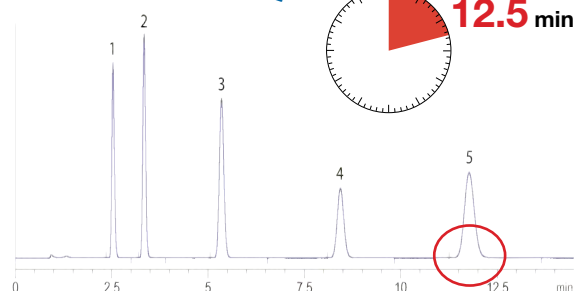


Column: YMC Hydrosphere C18, (5  $\mu$ m, 12 nm) 150 x 4.6 mm ID  
 Part-No.: HS12S05-1546WT  
 Eluent: 20 mM  $\text{KH}_2\text{PO}_4$ - $\text{K}_2\text{HPO}_4$  (pH 6.9)  
 Flow rate: 1.0 ml/min  
 Temperature: 37°C  
 Injection: 5  $\mu$ l  
 Detection: UV at 254 nm

# 2013

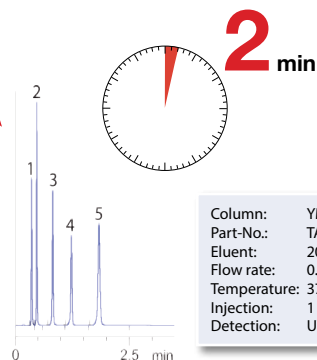


## YMC-Triart "AQ"



Column: YMC-Triart C18, (5  $\mu$ m, 12 nm) 150 x 4.6 mm ID  
 Part-No.: TA12S05-1546WT  
 Eluent: 20 mM  $\text{KH}_2\text{PO}_4$ - $\text{K}_2\text{HPO}_4$  (pH 6.9)  
 Flow rate: 1.0 ml/min  
 Temperature: 37°C  
 Injection: 5  $\mu$ l  
 Detection: UV at 254 nm

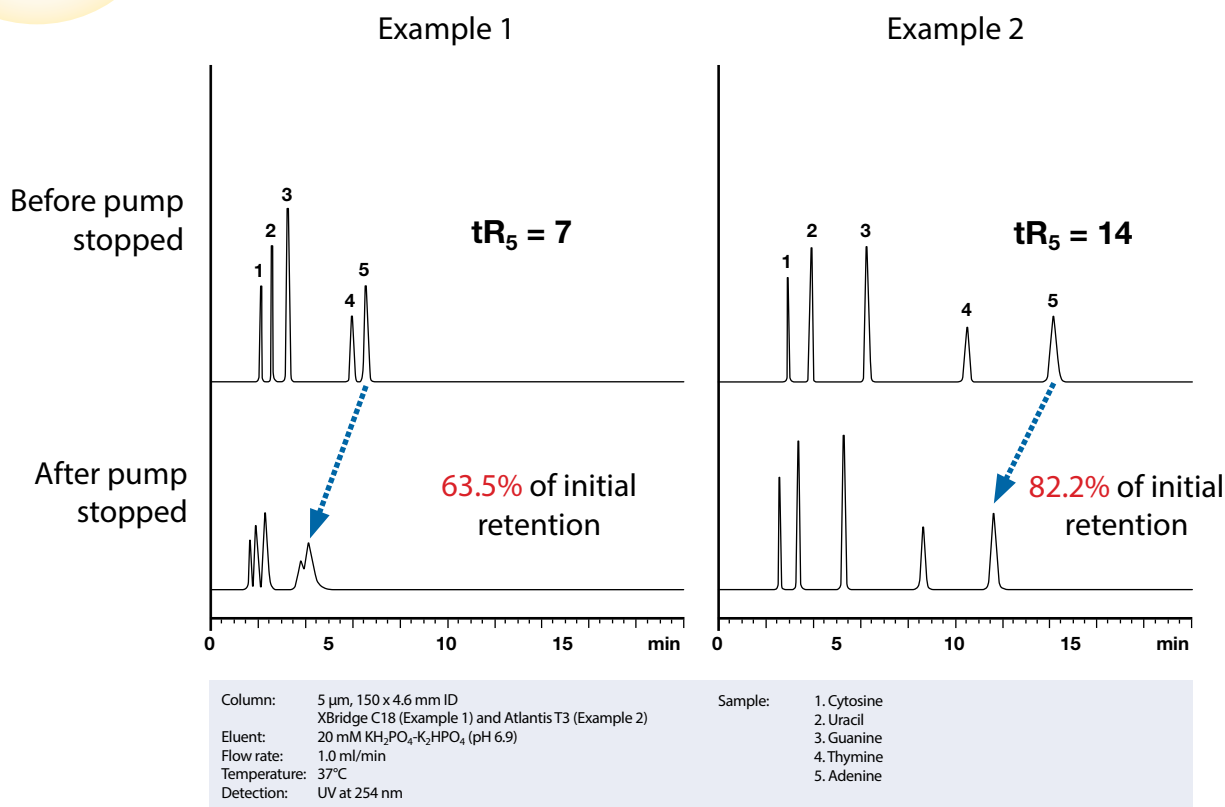
*improved peakshape and (U)HPLC!*



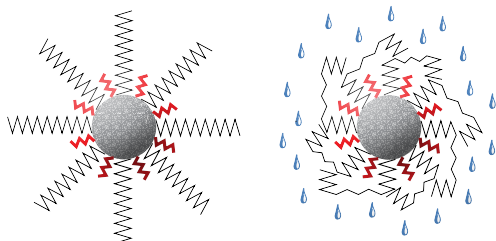
Column: YMC-Triart C18, (1.9  $\mu$ m, 12 nm) 50 x 2.0 mm ID  
 Part-No.: TA12SP9-0502PT  
 Eluent: 20 mM  $\text{KH}_2\text{PO}_4$ - $\text{K}_2\text{HPO}_4$  (pH 6.9)  
 Flow rate: 0.8 ml/min  
 Temperature: 37°C  
 Injection: 1  $\mu$ l  
 Detection: UV at 254 nm

*Scalable 1.9-3-5  $\mu$ m*

## Aqueous conditions deteriorate column performance

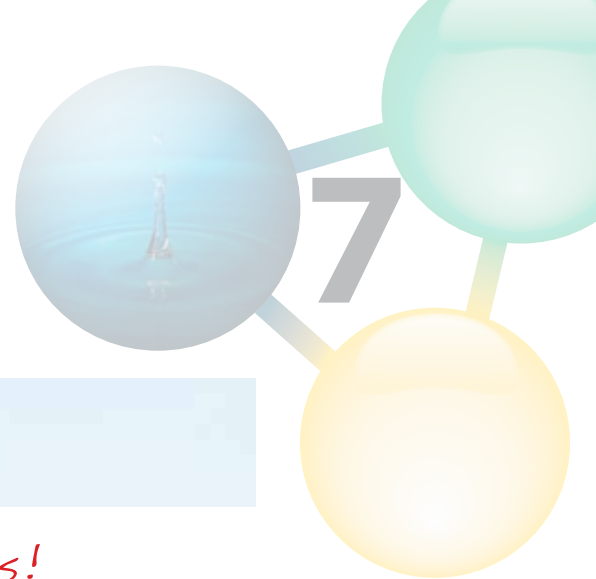


### Why? Image of C18 surface hydration



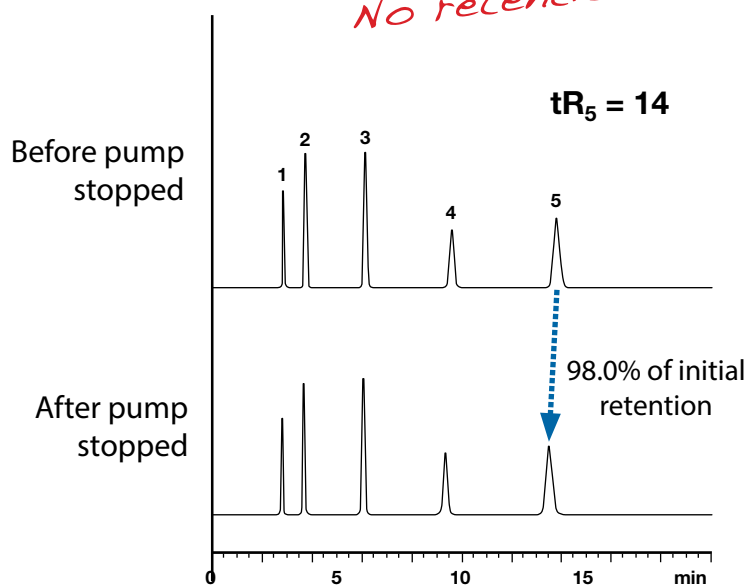
The columns used for applications involving 100% aqueous buffers provide shorter retention times after the flow was stopped between analyses.

This behaviour is caused by poor hydration of the phase. Polar compounds cannot easily distribute between the mobile phase and the stationary phase.

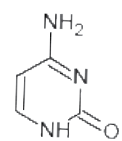


## Reproducible stable performance!

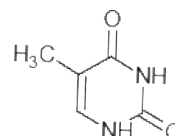
*No retention time changes!*



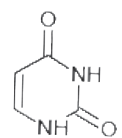
Column: YMC-Triart C18, (5  $\mu$ m, 12 nm) 150 x 4.6 mm ID  
 Part-No.: TA12505-1546WT  
 Eluent: 20 mM  $\text{KH}_2\text{PO}_4$ - $\text{K}_2\text{HPO}_4$  (pH 6.9)  
 Flow rate: 1.0 ml/min  
 Temperature: 37°C  
 Detection: UV at 254 nm



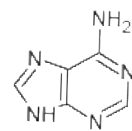
1. Cytosine



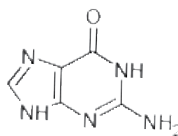
4. Thymine



2. Uracil

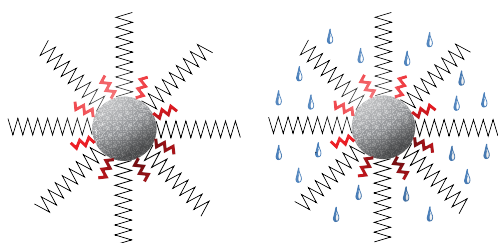


5. Adenine



3. Guanine

### Image of C18 surface hydration

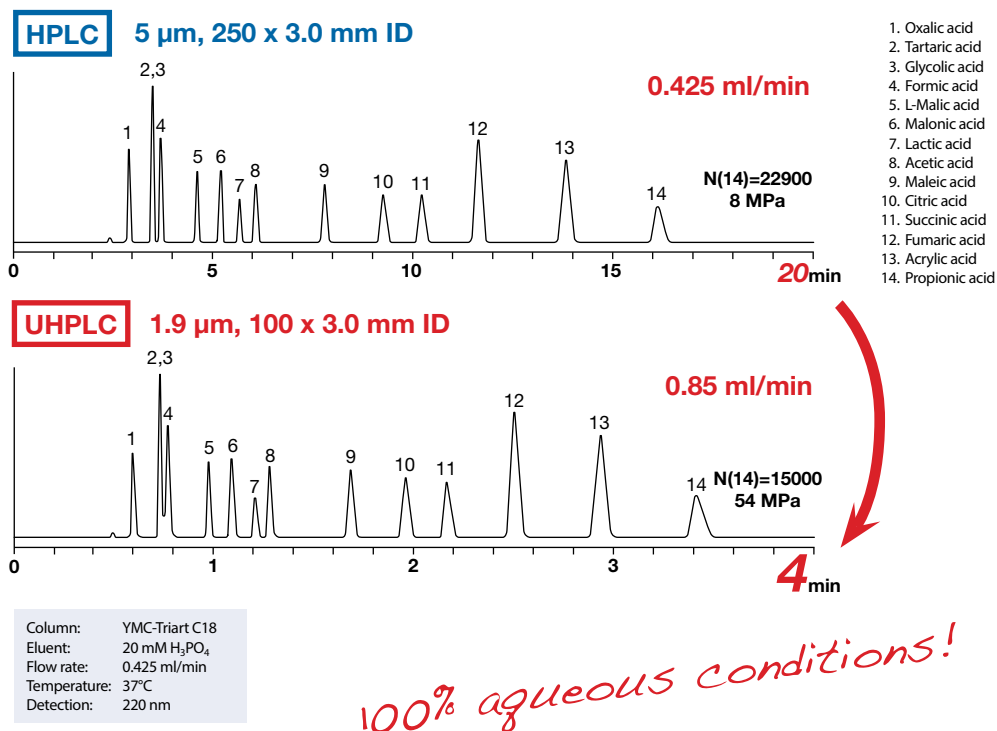


When Triart C18 columns are used for applications involving 100% aqueous buffers, the retention times are unchanged after the flow was stopped between analyses.

This is due to the improved hydration of the phase. Polar compounds can easily distribute between the mobile phase and the stationary phase.

8

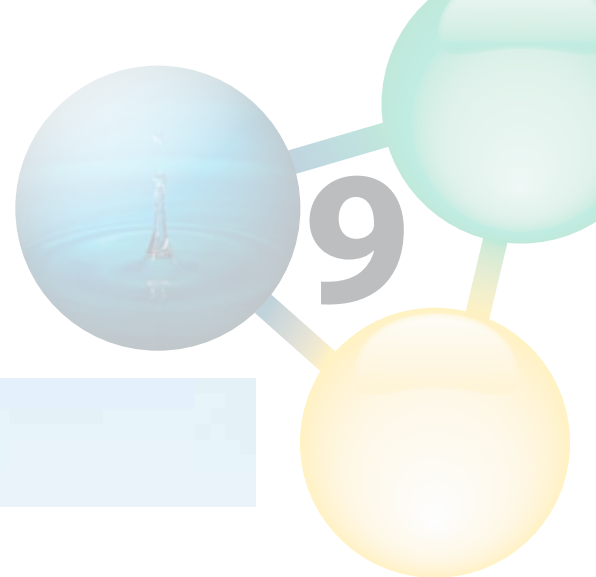
## From the inventors of AQ-columns: YMC-Triart C18 "validated" for AQ-conditions!



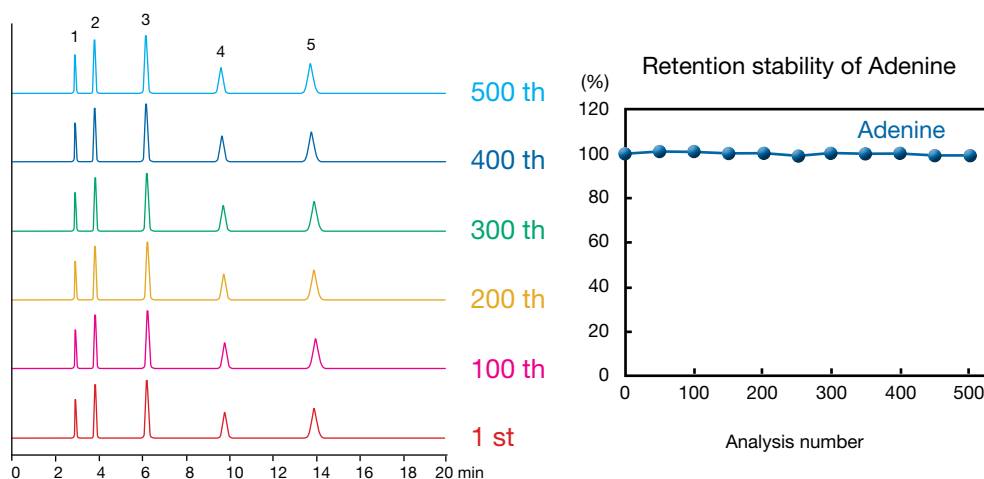
Stable under harsh conditions: pH 1-12 and temperature up to 70°C.

Stable retention times with 100% aqueous eluents!

Reproducible results day after day, column to column and lab to lab!

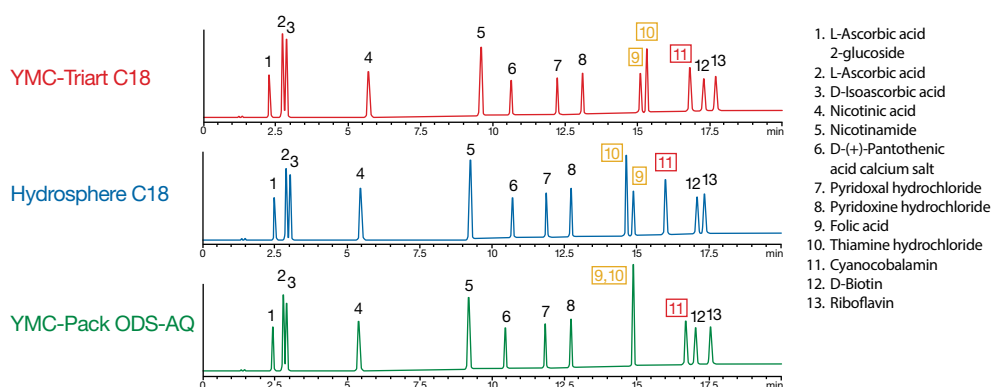


## Proven reliability



Column: YMC-Triart C18, (5  $\mu$ m, 12 nm) 150 x 3.0 mm ID  
 Part-No.: TA12S05-1530WT  
 Eluent: 20 mM  $\text{KH}_2\text{PO}_4$ - $\text{K}_2\text{HPO}_4$  (pH 6.9)  
 Flow rate: 0.425 ml/min  
 Temperature: 37°C  
 Detection: UV at 254 nm  
 Sample: 1. Cytosine 2. Uracil 3. Guanine 4. Thymine 5. Adenine

No change is found in the separation parameters including retention times, even after 500 injections when using Triart C18



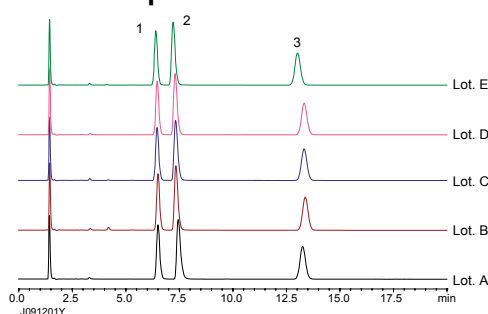
Column: 3  $\mu$ m, 150 x 3.0 mm ID  
 Part-No.: TA12S05-1530WT  
 Eluent: A) 20 mM  $\text{KH}_2\text{PO}_4$ - $\text{H}_3\text{PO}_4$  (pH 2.8) containing 5 mM  $\text{CH}_3(\text{CH}_2)_5\text{SO}_3\text{Na}$   
 B) 20 mM  $\text{KH}_2\text{PO}_4$ - $\text{H}_3\text{PO}_4$  (pH 2.8)/acetonitrile (80/20) containing 5 mM  $\text{CH}_3(\text{CH}_2)_5\text{SO}_3\text{Na}$   
 Flow rate: 0.425 ml/min  
 Temperature: 40°C  
 Detection: 210 nm

Retention behaviour of water-soluble vitamins on three YMC ODS phases which can be used with 100% aqueous mobile phases is compared. The retention times and peak elution order for folic acid (peak 9), thiamine hydrochloride (peak 10) and cyanocobalamin (peak 11) are different for the three phases due to the balance of hydrophobicity and hydrogen bond capacity differing between the three phases.

## Batch-to-Batch reproducibility

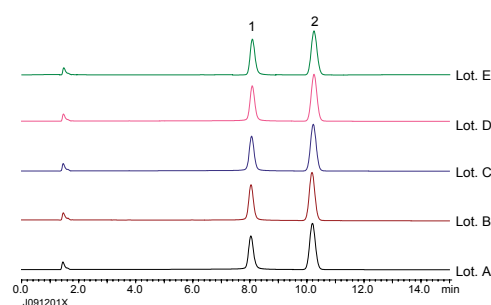
Excellent reproducibility of YMC-Triart phases is available even for the analysis for basic and coordination compounds which normally exhibit tailing and adsorption effects.

### Basic compounds



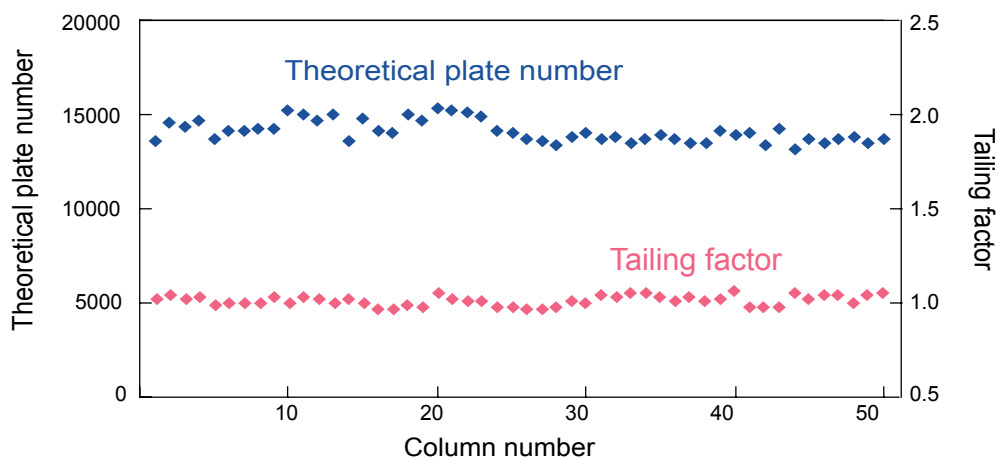
Column: YMC-Triart C18, 5  $\mu$ m, 150 x 3.0 mm ID  
 Part-No.: TA12S05-1503WT  
 Eluent: 20 mM  $\text{KH}_2\text{PO}_4$  (pH 6.9) / acetonitrile (65/35)  
 Flow rate: 0.425 ml/min  
 Temperature: 40  $^\circ\text{C}$   
 Detection: UV at 235 nm

### Coordination compounds

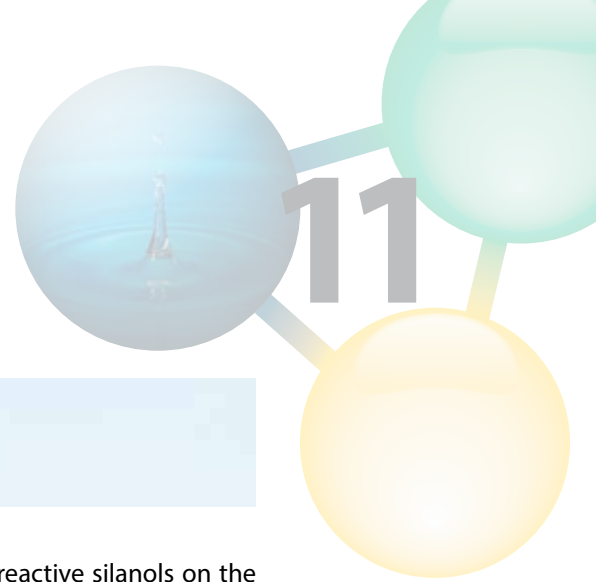


Column: YMC-Triart C18, 5  $\mu$ m, 150 x 3.0 mm ID  
 Part-No.: TA12S05-1503WT  
 Eluent: acetonitrile / 0.1%  $\text{H}_3\text{PO}_4$  (40/60)  
 Flow rate: 0.425 ml/min  
 Temperature: 40  $^\circ\text{C}$   
 Detection: UV at 254 nm

The reproducibility of packed columns is shown below in terms of theoretical plate number (N) and tailing factor (Tf). YMC-Triart packed columns exhibit a very narrow range of variation.



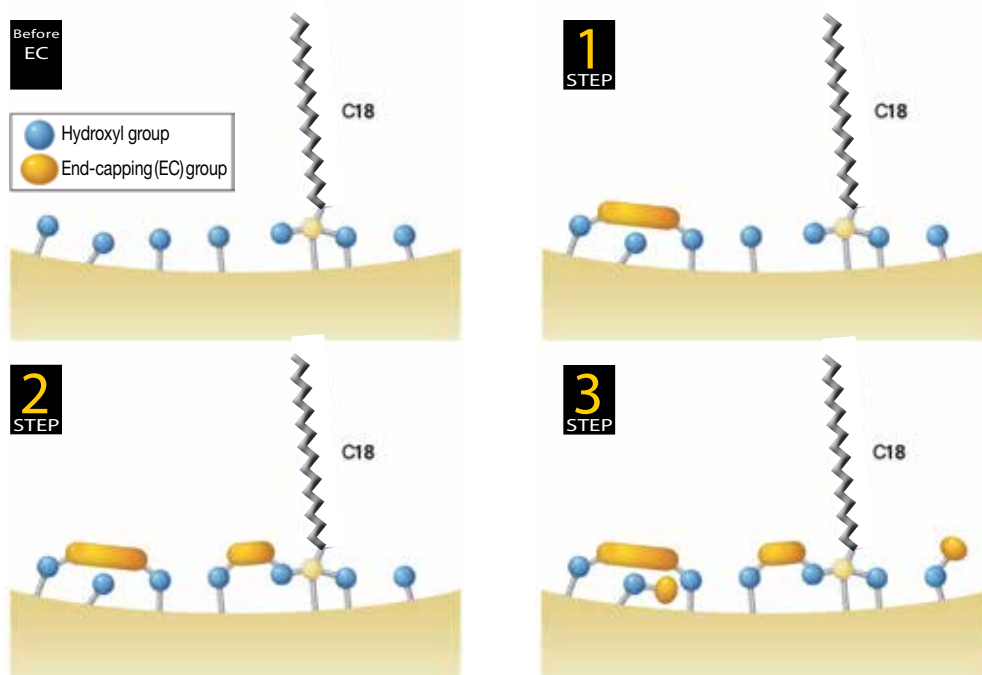
Column: YMC-Triart C18, 5  $\mu$ m, 150 x 4.6 mm ID  
 Part-No.: TA12S05-1546WT  
 Eluent: acetonitrile / water (40/60)  
 Flow rate: 1.0 ml/min  
 Temperature: ambient  
 Sample: butyl benzoate



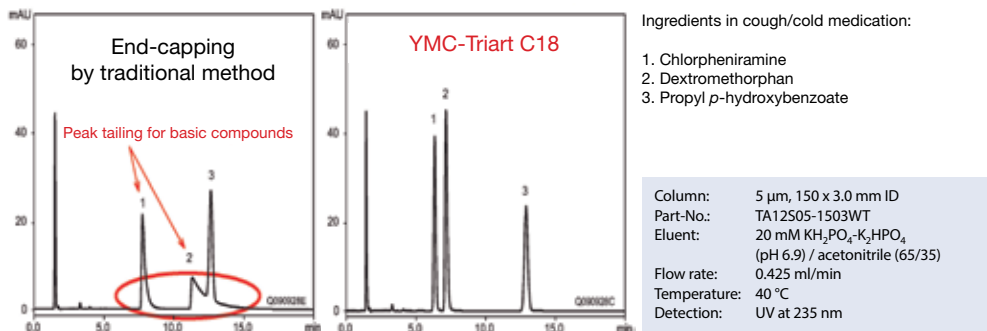
## Multi-stage endcapping

After bonding the alkyl chain, there are highly reactive and less reactive silanols on the surface. In traditional bonding processes, these are reacted with a single capping-compound in one step. However, the highly reactive silanols can be hydrolysed easily which contributes to the poor durability. The less reactive silanols are hard to endcap which results in poor resolution due to peak tailing.

YMC-Triart C18, C8 and Phenyl phases use a new innovation in endcapping called "multistage endcapping" for its surface modification process. By using a number of compounds with the different reactivities in successive steps, all silanols can be capped to the maximum extent.



The chromatographic result of a "good" endcapping is demonstrated:



## Substance Index for Applications contained in the General Brochure YMC-Triart (52 pages)

|                              |             |                                 |             |                                  |             |
|------------------------------|-------------|---------------------------------|-------------|----------------------------------|-------------|
| <b>A</b>                     | <b>page</b> | <b>C</b>                        | <b>page</b> | <b>H</b>                         | <b>page</b> |
| Acesulfame K                 | 11          | Chlortetracycline               | 13,27       | Halosulfuronmethyl               | 9           |
| 4-Acetamidoacetophenone      | 16          | trans-Cinnamic acid             | 31          | Hexobarbital                     | 29          |
| 2-Acetamidophenol            | 16,17       | Clemastine                      | 45          | Hinokitiol                       | 44          |
| Acetaminophene               | 17          | Clinamycin HCl                  | 33          | Human insulin                    | 12          |
| Acetaminophenone             | 16          | Coordinating compounds          | 44          | Homovanillic acid (HVA)          | 25          |
| Acetanilide                  | 16,17       | Copper 8-quinolinolate          | 9           | Hydrochlorothiazide              | 34          |
| Acetic acid                  | 44          | Cyanidin                        | 36          | 2-Hydroxyacetophenone            |             |
| 6"-O-Acetylaidzin            | 35          | Cyanidin-3-O-arabinoside        | 36          | 165-Hydroxyindoleacetic acid     |             |
| 6"-O-Acetylgenistin          | 35          | Cyanidin-3-O-galactoside        | 36          | (5HIAA)                          | 25          |
| 6"-O-Acetylglycitin          | 35          | Cyanidin-3-O-glucoside          | 36          | Hydroxychloroquine sulfate       | 17          |
| Acetylsalicylic acid         | 17          | Cyanocobalamin                  | 35          | 5-Hydroxytryptamine              |             |
| Aciclovir                    | 32          | Cyclamate Na                    | 11          | hydrochloride (5HT)              | 25          |
| Adenosine                    | 38          | Cytidine                        | 38          |                                  |             |
| Adrenaline hydrochloride (A) | 25          | Cytosine                        | 38          | <b>I</b>                         |             |
| Acidic compounds             | 44          |                                 |             | Ibuprofen                        | 21          |
| Alkaloids                    | 29          | <b>D</b>                        |             | Imipramine                       | 14          |
| Amino alcohol                | 19          | Daidzein                        | 31,35       | Insulin                          | 12          |
| 4-Aminophenone               | 16          | Daidzin                         | 35          | D-Isoascorbic acid               | 39          |
| Amitriptyline                | 14,21       | Delphinidin                     | 36          | Isobutyl p-hydroxybenzoate       | 33          |
| Amlodipine besilate          | 33,34       | Delphinidin-3-O-arabinoside     | 36          |                                  |             |
| Angiotensin I                | 12          | Delphinidin-3-O-galactoside     | 36          | <b>K</b>                         |             |
| Angiotensin II               | 12          | Delphinidin-3-O-glucoside       | 36          | Kaempferol                       | 31          |
| Angiotensin III              | 12          | Dextromethorphan                | 8,10,43,44  |                                  |             |
| Anthocyanidins               | 36          | Dihydroquinine                  | 29          | <b>L</b>                         |             |
| Anthocyanins                 | 36          | 3,4-Dihydroxymandelic           |             | Lincomycin HCl                   | 33          |
| Antidepressants              | 14          | acid (DOMA)                     | 25          | Luteolin                         | 31          |
| Aromatic carboxylic acids    | 31          | 3,4-Dihydroxyphenylacetic       |             |                                  |             |
| Artificial sweeteners        | 11          | acid (DOPAC)                    | 25          | <b>M</b>                         |             |
| L-Ascorbic acid              | 35,39       | 3,4-Dihydroxyphenylalanine      |             | Macrolide antibiotics            | 12          |
| L-Ascorbic acid 2-glucoside  | 35          | (DOPA)                          | 25          | Maleic acid sodium salt          | 15          |
| Asulam                       | 9           | 1,2-Dimethoxyl benzene          | 16          | 6"-O-Malonyldaidzin              | 35          |
| Atenolol                     | 13          | Diquat                          | 13          | 6"-O-Malonylgenistin             | 35          |
| Atorvastatin calcium hydrate | 34          | Dopamine hydrochloride (DA)     | 25          | 6"-O-Malonylglycitin             | 35          |
| Atropine                     | 39          | Doxycycline                     | 27          | Malvidin                         | 36          |
| Azoxystrobin                 | 9           | Duloxetine hydrochloride        | 19          | Malvidin-3-O-arabinoside         | 36          |
|                              |             |                                 |             | Malvidin-3-O-galactoside         | 36          |
| <b>B</b>                     |             | <b>E</b>                        |             | Malvidin-3-O-glucoside           | 36          |
| Baicalein                    | 30          | Endorphins                      | 37          | Mecoprop                         | 9           |
| Barbital                     | 29          | Enkephalins                     | 37          | Metformin hydrochloride          | 38          |
| Barbiturates                 | 29          | Epinephrine hydrochloride       | 25          | 3-Methoxy-4-hydroxyphenyl-       |             |
| Basic compounds              | 44          | Erythorbic acid                 | 35,39       | glycol (MHPG)                    | 25          |
| Basic drugs                  | 34          | Erythromycin                    | 12,30       | 3-Methoxytyramine                |             |
| Benzethonium chloride        | 15          | Erythromycin estolate           | 30          | hydrochloride (3MT)              | 25          |
| Benzyl alcohol               | 7           | Erythromycin ethylsuccinate     | 30          | Methyl benzoate                  | 16,44       |
| Betablockers                 | 13          | Etizolam                        | 26          | 4-Methylcatechol                 | 14          |
| Bovine insulin               | 12          |                                 |             | Methyl p-hydroxybenzoate         | 31          |
| n-Butylbenzene               | 21          | <b>F</b>                        |             | 2-Methylresorcinol               | 14          |
| Butyl benzoate               | 7,10,41     | Fexofenadine hydrochloride      | 22,23       | 2,5-Methylresorcinol             | 14          |
| Brilliant blue FCF           | 24          | Flavonoids                      | 31          | Metoprolol                       | 13          |
|                              |             | Flazasulfuron                   | 9           |                                  |             |
| <b>C</b>                     |             | Formic acid                     | 44          | <b>N</b>                         |             |
| Caffeine                     | 17          |                                 |             | Nadolol                          | 13          |
| Candesartan cilexetil        | 34          | <b>G</b>                        |             | Naphazolin HCl                   | 15          |
| Carvedilol                   | 34          | Genistein                       | 35          | Neostigmine methylsulfate        | 15          |
| Catecholamines               | 25          | Genistin                        | 35          | Neurotensin                      | 37          |
| 4-Chloroacetanilide          | 16          | Glycitein                       | 35          | Nicotinamide                     | 35          |
| Chloroquine phosphate        | 17          | Glycitin                        | 35          | Nicotinic acid                   | 32,35       |
| Chlorphenamine               | 10          | Glycyrrhizin acid ammonium salt | 15          | 4-Nitrocatechol                  | 14          |
| Chlorpheniramine             | 8,43,44     | Guaiacol                        | 16          | 4-Nitrophenol                    | 16          |
| Chlorpheniramine maleate     | 15          | Guanosine                       | 38          | Noradrenaline hydrochloride (NA) | 25          |

## Substance Index for Applications contained in the General Brochure YMC-Triart (52 pages)

| <b>N</b>                     | <b>page</b> | <b>P</b>                 | <b>page</b> | <b>T</b>                    | <b>page</b> |
|------------------------------|-------------|--------------------------|-------------|-----------------------------|-------------|
| Norepinephrine hydrochloride | 25          | Propanolol               | 13,42       | o-Terphenyl                 | 21          |
| Nortriptyline                | 14          | Propionic acid           | 44          | Testosterone                | 21          |
| <b>O</b>                     |             | n-Propylbenzene          | 21          | Tetracycline antibiotics    | 13,27       |
| Organic acids                | 44          | Propyl paraben           | 8,10        | Tetrahydrozoline HCl        | 15          |
| Ortho isomer                 | 19          | Propyl p-hydroxybenzoate | 43,44       | Thiamine HCl                | 35          |
| Oxine-copper                 | 9           | Pyridoxine HCl           | 15,35       | Thiram                      | 9           |
| Oxytetracycline              | 13,27       | Pyrocatechol             | 14,16       | Toluol                      | 14          |
| Oxytocin                     | 37          | <b>Q</b>                 |             | Triazolam                   | 26          |
| <b>P</b>                     |             | Quinine                  | 29          | Triclopypyr                 | 9           |
| Paracetamol                  | 16          | 8-Quinololinol           | 21          | Triphenolene                | 21          |
| Para isomer                  | 19          | <b>R</b>                 |             | Tryptophan (Trp)            | 25          |
| Paraquat                     | 13          | Rebaudioside A           | 15          | Tyrosine (Tyr)              | 25          |
| Pentobarbital                | 29          | Resorcinole              | 14          | <b>U</b>                    |             |
| Peonidin                     | 36          | Riboflavin               | 35          | Uracil                      | 12,38       |
| Peonidin-3-O-arabinoside     | 36          | <b>S</b>                 |             | Uridine                     | 38          |
| Peonidin-3-O-galactoside     | 36          | Saccharin                | 11          | <b>V</b>                    |             |
| Peonidin-3-O-glucoside       | 36          | Salicylic acid           | 17,31       | Valsartan                   | 34          |
| Peptides                     | 37          | Scopolamine              | 29          | Vanillylmandelic acid (VMA) | 25          |
| Pesticides                   | 28          | Secobarbital             | 29          | Verapamil                   | 42          |
| Petunidin                    | 36          | Serotonin hydrochloride  | 25          | Vitamin B1                  | 35          |
| Petunidin-3-O-arabinoside    | 36          | Siduron                  | 9           | Vitamin B2                  | 35          |
| Petunidin-3-O-galactoside    | 36          | Soy isoflavones          | 33          | Vitamin B6                  | 35          |
| Petunidin-3-O-glucoside      | 36          | Spiramycin               | 12          | Vitamin B12                 | 35          |
| Phenacetine                  | 17          | Stevioside hydrate       | 15          | Vitamin C                   | 35          |
| Phenobarbital                | 38          | Sulpha drugs             | 12          | Vitamin D2                  | 20          |
| Phenoformin hydrochloride    | 38          | Sulphamerazin            | 12          | Vitamin D3                  | 20          |
| Phenol                       | 7,16        | Sulphamethoxazole        | 12          | <b>W</b>                    |             |
| Pindolol                     | 13          | Sulphathiazole           | 12          | Water-soluble vitamins      | 35          |
| Porcine insulin              | 12          |                          |             |                             |             |

## Substance Index for Applications contained in this Brochure

| <b>Substance</b>            | <b>page</b> | <b>Substance</b>   | <b>page</b> | <b>Substance</b>         | <b>page</b> |
|-----------------------------|-------------|--------------------|-------------|--------------------------|-------------|
| Acetic acid                 | 8           | Fumaric acid       | 8           | D-(+)-Pantothenic acid   | 9           |
| Acrylic acid                | 8           | Glycolic acid      | 8           | acid calcium salt        | 8           |
| Adenine                     | 4,5,6,7,9   | Guanine            | 4,5,6,7,9   | Propionic acid           | 8           |
| L-Ascorbic acid             | 9           | D-Isoascorbic acid | 9           | Pyridoxal hydrochloride  | 9           |
| L-Ascorbic acid 2-glucoside | 9           | Lactic acid        | 8           | Pyridoxine hydrochloride | 9           |
| D-Biotin                    | 9           | Maleic acid        | 8           | Riboflavin               | 9           |
| Butyl benzoate              | 10          | L-Malic acid       | 8           | Succinic acid            | 8           |
| Citric acid                 | 8           | Malonic acid       | 8           | Tartaric acid            | 8           |
| Cyanocobalamin              | 9           | Nicotinamide       | 9           | Thiamine hydrochloride   | 9           |
| Cytosine                    | 4,5,6,7,9   | Nicotinic acid     | 9           | Thymine                  | 4,5,6,7,9   |
| Folic acid                  | 9           | Oxalic acid        | 8           | Uracil                   | 4,5,6,7,9   |
| Formic acid                 | 8           |                    |             |                          |             |

The following brands, trademarks, or service marks are the property of the listed company and/or its subsidiaries. Every effort has been taken to ensure this list is accurate at the time of printing this brochure.

Atlantis T3, X-Bridge C18 are trademarks of Waters Corp.

Application Data by courtesy of YMC Co., Ltd.

## Ordering Information

### YMC-Triart C18, 1.9 $\mu$ m UHPLC columns (max. pressure 1,000 bar)

| Phase | Column ID (mm) | Column length (mm) |                |                |                |                | Guard cartridges* with 5 mm length (pack of 3) |
|-------|----------------|--------------------|----------------|----------------|----------------|----------------|------------------------------------------------|
|       |                | 30                 | 50             | 75             | 100            | 150            |                                                |
| C18   | 2.0            | TA12SP9-0302PT     | TA12SP9-0502PT | TA12SP9-L502PT | TA12SP9-1002PT | TA12SP9-1502PT | TA12SP9-E5Q1CC                                 |
|       | 3.0            | —                  | TA12SP9-0503PT | TA12SP9-L503PT | TA12SP9-1003PT | TA12SP9-1503PT | TA12SP9-E503CC                                 |

\*Guard cartridge holder required, part no. XPCUHP

**NEW**

### YMC-Triart C18 plus, 3 $\mu$ m high pressure rated analytical columns (max. pressure 450 bar)

| Phase | Column ID (mm) | Column length (mm) |                 |                 |                 |                 |                 |                 | Guard cartridges* with 10 mm length (pack of 5) |
|-------|----------------|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------------------------|
|       |                | 20                 | 33              | 50              | 75              | 100             | 150             | 250             |                                                 |
| C18   | 2.1            | TA12S03-02Q1PTH    | TA12S03-H3Q1PTH | TA12S03-05Q1PTH | TA12S03-L5Q1PTH | TA12S03-10Q1PTH | TA12S03-15Q1PTH | —               | TA12S03-01Q1GC                                  |
|       | 3.0            | —                  | —               | TA12S03-0503PTH | TA12S03-L503PTH | TA12S03-1003PTH | TA12S03-1503PTH | —               | TA12S03-0103GC                                  |
|       | 4.6            | —                  | TA12S03-H346PTH | TA12S03-0546PTH | TA12S03-L546PTH | TA12S03-1046PTH | TA12S03-1546PTH | TA12S03-2546PTH | TA12S03-0104GC                                  |

\*Guard cartridge holder required, part no. XPGCH-Q1

**NEW**

### YMC-Triart C18 plus, 5 $\mu$ m high pressure rated analytical columns (max. pressure 450 bar)

| Phase | Column ID (mm) | Column length (mm) |                 |                 |                 |                 |                 |                 | Guard cartridges* with 10 mm length (pack of 5) |
|-------|----------------|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------------------------|
|       |                | 20                 | 33              | 50              | 75              | 100             | 150             | 250             |                                                 |
| C18   | 2.1            | TA12S05-02Q1PTH    | TA12S05-H3Q1PTH | TA12S05-05Q1PTH | TA12S05-L5Q1PTH | TA12S05-10Q1PTH | TA12S05-15Q1PTH | —               | TA12S05-01Q1GC                                  |
|       | 3.0            | —                  | —               | TA12S05-0503PTH | TA12S05-L503PTH | TA12S05-1003PTH | TA12S05-1503PTH | —               | TA12S05-0103GC                                  |
|       | 4.6            | —                  | TA12S05-H346PTH | TA12S05-0546PTH | TA12S05-L546PTH | TA12S05-1046PTH | TA12S05-1546PTH | TA12S05-2546PTH | TA12S05-0104GC                                  |

\*Guard cartridge holder required, part no. XPGCH-Q1

Triart „plus“ specifies a novel column hardware technology with increased pressure rating; specifications for the proven bonding chemistries remain identical irrespective of the selected column hardware format.

### YMC-Triart C18, 3 $\mu$ m analytical columns (max. pressure 200/250 bar)

| Phase | Column ID (mm) | Column length (mm) |                |                |                |                | Guard cartridges* with 10 mm length (pack of 5) |
|-------|----------------|--------------------|----------------|----------------|----------------|----------------|-------------------------------------------------|
|       |                | 50                 | 75             | 100            | 150            | 250            |                                                 |
| C18   | 2.0            | TA12S03-0502WT     | TA12S03-L502WT | TA12S03-1002WT | TA12S03-1502WT | —              | TA12S03-01Q1GC                                  |
|       | 3.0            | TA12S03-0503WT     | TA12S03-L503WT | TA12S03-1003WT | TA12S03-1503WT | —              | TA12S03-0103GC                                  |
|       | 4.6            | TA12S03-0546WT     | TA12S03-L546WT | TA12S03-1046WT | TA12S03-1546WT | TA12S03-2546WT | TA12S03-0104GC                                  |

\*Guard cartridge holder required, part no. XPGCH-Q1

### YMC-Triart C18, 5 $\mu$ m analytical columns (max. pressure 200/250 bar)

| Phase | Column ID (mm) | Column length (mm) |                |                |                |                | Guard cartridges* with 10 mm length (pack of 5) |
|-------|----------------|--------------------|----------------|----------------|----------------|----------------|-------------------------------------------------|
|       |                | 50                 | 75             | 100            | 150            | 250            |                                                 |
| C18   | 2.0            | TA12S05-0502WT     | TA12S05-L502WT | TA12S05-1002WT | TA12S05-1502WT | —              | TA12S05-01Q1GC                                  |
|       | 3.0            | TA12S05-0503WT     | TA12S05-L503WT | TA12S05-1003WT | TA12S05-1503WT | —              | TA12S05-0103GC                                  |
|       | 4.6            | TA12S05-0546WT     | TA12S05-L546WT | TA12S05-1046WT | TA12S05-1546WT | TA12S05-2546WT | TA12S05-0104GC                                  |

\*Guard cartridge holder required, part no. XPGCH-Q1

## Ordering Information

### EXP® Guard Cartridge Column

| Packing material                  | Column size<br>Length x ID (mm) | Product code   |            |
|-----------------------------------|---------------------------------|----------------|------------|
| YMC-Triart C18<br>(1.9 µm, 12 nm) | 5 x 2.1                         | TA12SP9-E5Q1CC | (3 / pack) |
|                                   | 5 x 3.0                         | TA12SP9-E503CC | (3 / pack) |

A cartridge holder will need to be purchased separately before using this product for the first time.  
Other phase than listed above, please inquire us.

### Cartridge Holder

| Product name / Specification                                                                                                           | Product code |            |
|----------------------------------------------------------------------------------------------------------------------------------------|--------------|------------|
| EXP® direct connect holder<br>(1 titanium hybrid ferrule included)<br>Ferrule is adjustable.<br>Pressure rated to 140 MPa (20,000 psi) | XPCHUHP      | (1 / pack) |

### YMC-Triart, 12 nm, 5 µm in ACTUS high-throughput semipreparative hardware (max. pressure 300 bar)

| Phase | Column ID<br>(mm) | Column length (mm) |                |                |                |                |
|-------|-------------------|--------------------|----------------|----------------|----------------|----------------|
|       |                   | 50                 | 75             | 100            | 150            | 250            |
| C18   | 20.0              | TA12S05-0520WX     | —              | TA12S05-1020WX | TA12S05-1520WX | TA12S05-2520WX |
|       | 30.0              | TA12S05-0530WX     | TA12S05-L530WX | TA12S05-1030WX | TA12S05-1530WX | TA12S05-2530WX |

### YMC-Triart, preparative bulk media

| YMC-Triart C18-S  |                       |              |
|-------------------|-----------------------|--------------|
| Pore size<br>(nm) | Particle size<br>(µm) | Product Code |
| 12                | 10                    | TAS12S11     |
|                   | 15                    | TAS12S16     |
|                   | 20                    | TAS12S21     |
|                   | —                     | —            |

Available in pack sizes 100 g, 500 g, 1 kg, 5 kg, 25 kg

Please inquire for the corresponding brochures:

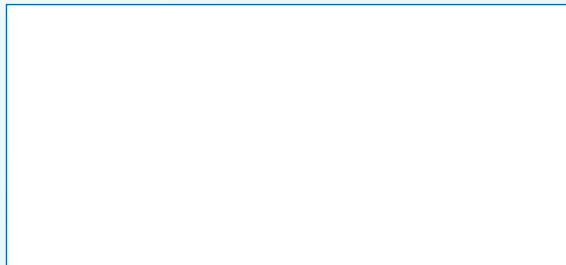
#### General Brochure YMC-Triart (52 p.)



#### YMC-Triart Prep Brochure (12 p.)



Your local distributor:



**YMC Co., Ltd.**

YMC Karasuma-Gojo Bld. 284 Daigo-cho,  
Karasuma Nishiiru Gojo-dori Shimogyo-ku,  
Kyoto 600-8106 Japan  
TEL. +81(0)75-342-4515, FAX +81(0)75-342-4550  
[www.ymc.co.jp](http://www.ymc.co.jp)

**YMC Europe GmbH**

Schöttmannshof 19  
D-46539 Dinslaken  
Germany  
TEL. +49(0)2064/427-0, FAX +49(0)2064/427-222  
[www.ymc.de](http://www.ymc.de)

**YMC America, Inc.**

941 Marcon Boulevard Suite 201  
Allentown, PA18109 USA  
TEL. +1-610-266-8650, FAX +1-610-266-8652  
[www.ymcamerica.com](http://www.ymcamerica.com)

**YMC Taiwan Co., Ltd.**

3F, No. 1353, Zhongzheng Rd.,  
Taoyuan City, Taoyuan Country 330,  
Taiwan (R.O.C.)  
TEL. +886-3-2150-630, FAX +886-3-2150-286  
[www.ymctaiwan.com](http://www.ymctaiwan.com)

**YMC Korea Co., Ltd.**

#208, Owners Tower, 16-5, Sunae-dong,  
Bundang-gu, Seongnam-si, Gyeonggi-do,  
463-825 Korea  
TEL. +82-31-716-1631, FAX +82-31-716-1630  
[www.ymckorea.com](http://www.ymckorea.com)

**YMC India Pvt. Ltd.**

A-154, Eros Boulevard Hilton Hotel Complex Plot No.13-  
B, District Centre Mayur Vihar Phase-I  
New Delhi-110091 India  
TEL. +91-11-45041601;45041701, FAX +91-11-45041901  
[www.ymcindia.com](http://www.ymcindia.com)

**YMC Co., Ltd. Shanghai Rep. Office**

Far East International Plaza A2404  
No. 319 Xianxia Road, Shanghai 200051  
P.R. China  
TEL. +86-21-6235-1388, FAX +86-21-6235-1398  
[www.ymcchina.com](http://www.ymcchina.com)

**YMC Singapore Tradelinks Pte. Ltd.**

6 Indus Road, #13-09 Emerald Park, Tower 1,  
Singapore 169588  
TEL.+65-9023-7617  
[www.ymc.sg](http://www.ymc.sg)