## Kromasil<sup>®</sup> Eternity<sup>™</sup> Designed for long life

For use in HPLC and UHPLC



Tomorrow's Answers Today



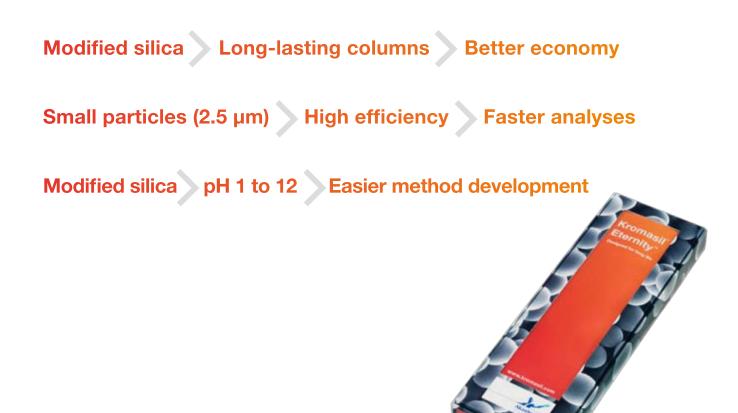
## The long-lasting phase for demanding applications

Imagine working under virtually no pH restrictions during method development. That's exactly what Kromasil Eternity<sup>™</sup> allows you to.

Kromasil Eternity<sup>™</sup> is our latest innovation for separation and purification of compounds under reversed phase HPLC and UHPLC. Since many pharmaceutical compounds are ionizable, the broad pH user window from 1 to 12 allows you more flexibility in altering retention time during method development.

However, wide pH variations have a negative impact on column lifetime. That's why Kromasil Eternity<sup>™</sup> is based on a patent pending grafting technology (see the three-step description), securing a long-lasting product even under tough pH conditions as well as at high temperatures.

This folder gives an overview of how you benefit. To learn more, visit www.kromasil.com or contact us directly.



#### **Bare silica**

Produced in-house at AkzoNobel/Separation Products, ensuring high mechanical stability and efficiency. Pore size: 100 Å.

#### Organosilane bonding

#### **Modified silica**

The silica is bonded with an organosilane layer. Under specific proprietary conditions, the organosilane layer penetrates the silica, which results in a merged organic/inorganic interfacial gradient. The pores are virtually returned to their original size resulting in a surface presenting both inorganic (-OH) and organic (-R) silicic acid moieties. This process step is what gives Kromasil Eternity<sup>™</sup> its extreme chemical stability extending the pH range and column lifetime.

#### **Finished product**

Finally, the product is functionalized with C18 followed by a proprietary endcapping process.

# The product program

#### Product assortment<sup>1,2,3</sup>

	2.5 µm Eternity <sup>™</sup>	5 µm Eternity <sup>™</sup>
2.1 x 50 mm	Eternity-2.5-C18 2.1 x 50	Eternity-5-C18 2.1 x 50
2.1 x 100 mm 2.1 x 150 mm	Eternity-2.5-C18 2.1 x 100	 Eternity-5-C18 2.1 x 150
4.6 x 50 mm	Eternity-2.5-C18 4.6 x 50	Eternity-5-C18 4.6 x 50
4.6 x 100 mm	Eternity-2.5-C18 4.6 x 100	Eternity-5-C18 4.6 x 100
4.6 x 150 mm	_	Eternity-5-C18 4.6 x 150
4.6 x 250 mm	—	Eternity-5-C18 4.6 x 250
10 x 50 mm	_	Eternity-5-C18 10 x 50
10 x 150 mm	_	Eternity-5-C18 10 x 150
10 x 250 mm	-	Eternity-5-C18 10 x 250
21.2 x 50 mm	_	Eternity-5-C18 21.2 x 50
21.2 x 150 mm	_	Eternity-5-C18 21.2 x 150
21.2 x 250 mm	-	Eternity-5-C18 21.2 x 250
30 x 50 mm	-	Eternity-5-C18 30 x 50
30 x 150 mm	_	Eternity-5-C18 30 x150
30 x 250 mm	-	Eternity-5-C18 30 x 250

<sup>1)</sup> Other column dimensions available upon request.

<sup>2)</sup> Also available in columns for UHPLC use.

<sup>3)</sup> Guard columns are available for each column dimension

#### **Analytical scale**

- 2.5 µm particle size
- UHPLC and HPLC (> 200 000 plates/m)
- Easy to scale up to 5 µm

#### Semi preparative scale

- 5 µm particle size
- HPLC
- Easy to scale down to 2.5 µm

### **Product characteristics**

C18	
2.5 µm & 5 µm	
100 Å	
330 m²/g	
14%	
Proprietary	
1 -12	
L1	
	2.5 μm & 5 μm 100 Å 330 m²/g 14% Proprietary 1 -12



## **Application tests**

### Long term pH stability test

20 min 100% A

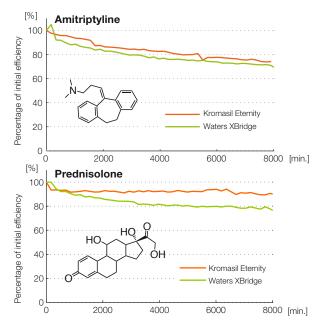
#### Test conditions

Columns:

Mobile phase A: Mobile phase B: Flow rate: Temperature: Gradient Kromasil Eternity-5-C18 4.6  $\times$  250 mm Waters XBridge, 5 µm, C18, 4.6  $\times$  250 mm 10 mM ammonium bicarbonate, pH 10.5/acetonitrile (90/10) 10 mM ammonium bicarbonate, pH 10.5/acetonitrile (10/90) 1 ml/min 45°C 0 min 100% A 10 min 100% B 15 min 100% B 16 min 100% A

Test amitriptyline: Test prednisolone: Test cycle:

10 mM ammonium bicarbonate, pH 10.5/acetonitrile (30/70) e: 10 mM ammonium bicarbonate, pH 10.5/acetonitrile (70/30) 6 × gradient + tests = 172 min/cycle

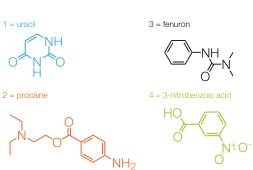


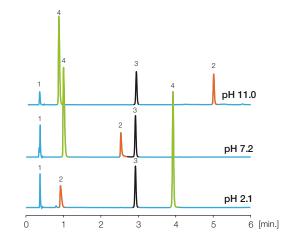
### pH variation to control selectivity

#### Test conditions

Column: Mobile phase:

Gradient: Flow rate: Temperature: Detection: Kromasil Eternity-2.5-C18 4.6 x 50 mm acetonitrile/20 mM sodium phosphate pH 2.1, 7.2 and 11.0, respectively 0-0.5 min: 10%, 5.5 min: 50% acetonitrile 1.5 ml/min 25°C UV 254 nm

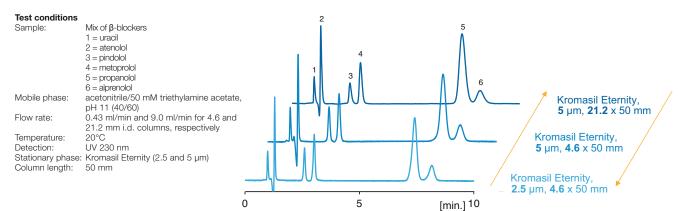




### **Time efficiency**

#### 3 Test conditions 2 Mobile phase: acetonitrile/water/formic acid (25/75/0.1) Substances: Mix of sulfa-drugs Rs = 13Λ 1 = uracil Save even more 2 =sulphathiazole 3 =sulphamerazin time with shorter column and 4 = sulphamethoxazole З increased flow rate Temperature: 25°C Detection: UV 254 nm 2 Save time Bs = 25without resolution 0 0.3 0.6 0.9 1.2 [min.] loss by decreas-ing particle size З Stationary phase: Kromasil Eternity-2.5-C18 2 Column size: 4.6 x 50 mm Flow rate: 2.7 ml/min Bs = 260 0.5 1.5 2 [min.] 1 Stationary phase: Kromasil Eternity-2.5-C18 Column size: 4.6 x 100 mm Run at 1/14 of original analysis time Flow rate: 1.6 ml/min 0 5 10 15 [min.] Stationary phase: Kromasil Eternity-5-C18 Column size: 4.6 x 250 mm Flow rate: 1.0 ml/min

### Scale-up or Scale-down



The moment you adopt our Kromasil High Performance Concept, you join thousands of chromatographers who share a common goal: to achieve better separations when analyzing or isolating pharmaceuticals or other substances.

Not only will you benefit from our patented silica technology, but you gain a strong partner with a reliable track record in the field of silica products. For the past 60 years, Eka Chemicals has pioneered new types of silica. Our long experience in the field of silica chemistry is the secret behind the development of Kromasil, and the success of our Separation Products Group.

Kromasil is available in bulk, or in high-pressure slurry-packed columns. The development, production and marketing of Kromasil are ISO 9001 certified.

Eka Chemicals is a global company with 2 900 people in 18 countries. It is a business unit within AkzoNobel, one of the world's largest chemical groups, with more than 60 000 employees in 80 countries.

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## **Kromasil**<sup>®</sup>