

*Polysaccharide-based chiral HPLC
phases for better performance*



Kromasil® AmyCoat™

Kromasil® CelluCoat™

Designed to stretch the limits.

Kromasil® AmyCoat™ and Kromasil® CelluCoat™ stretch the limits for analytical and industrial chiral chromatography. The silica is based on an in-house developed matrix and coated with a functionalized amylose or cellulose selector. High resolution, excellent selectivity, no pressure limits* and stable performance when switching between compatible mobile phases are some important benefits.

ANALYTICAL CHROMATOGRAPHY

NO PRESSURE LIMITS ► HIGH FLOW RATES ► FASTER ANALYSES

SMALL PARTICLES (3 µm) ► HIGH RESOLUTION ► BETTER ANALYSES

UNIQUE COATING METHOD ► EXCELLENT SELECTIVITY ► BETTER ANALYSES

PREPARATIVE CHROMATOGRAPHY

UNIQUE SILICA MATRIX ► MECHANICALLY STRONG ► LONGER LIFETIME

WIDE RANGE OF PARTICLES ► CONSISTENT PERFORMANCE ► EASIER TO SCALE UP

UNIQUE COATING METHOD ► HIGHER LOADABILITY ► HIGHER PRODUCTIVITY

* Kromasil AmyCoat and Kromasil CelluCoat can withstand flow rates equivalent to pressures of up to 400 bar—i.e. the approximate limit for most HPLC systems.



Peak performance. Expect nothing less.

To speed up and simplify method development, we have removed some of the restrictions for coated polysaccharide phases. In analytical scale chromatography, 3 μm particles and the absence of pressure limits allow faster chromatography with better results than ever before.

BETTER RESULTS

Both Kromasil AmyCoat and Kromasil CelluCoat show great enantioselectivity for many different racemates. In a separate section of the brochure, you will find an application guide showing exactly the performance levels you can expect.

By having access to 3 μm particles, it enables a higher plate count and resolution for analytical chromatography. Combined with great selectivity, this facilitates the separation of the enantiomers.

FASTER RESULTS

Not only can you get better results with Kromasil AmyCoat and Kromasil CelluCoat you also get them faster. Thanks to a product characteristic like the absence of pressure limits, you can run analytical chromatography at very high flow rates and save time.

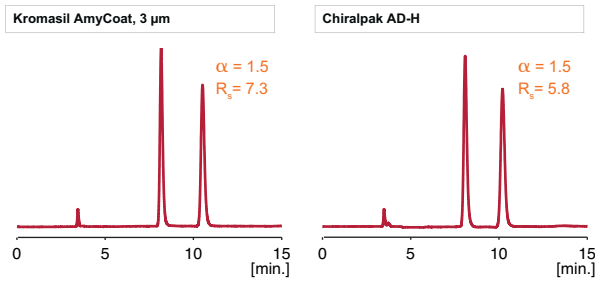
The high selectivity and 3 μm particles are also important factors in speeding up the method. You achieve an improved resolution, which, in turn, allows a higher flow rate.



Kromasil® AmyCoat™ and Kromasil® CelluCoat™ are available in particle sizes down to 3 μm .

Kromasil® AmyCoat™

Selectivity and resolution comparison—Kromasil AmyCoat 3 µm and Chiralpak AD-H (5 µm).

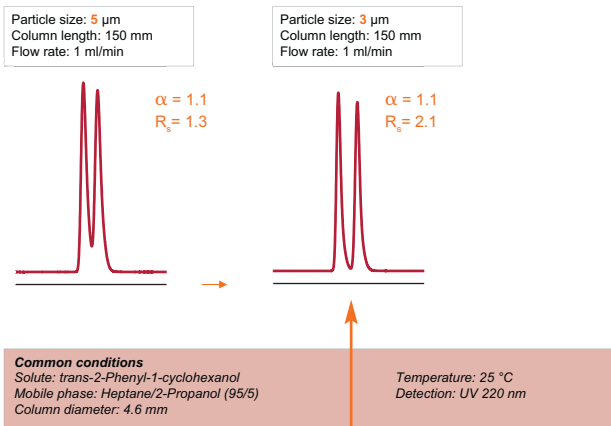


Common conditions
 Solute: Carbinoxamine
 Mobile phase: Heptane/2-Propanol/DEA (90/10/0.1)
 Column size: 4.6 × 150 mm
 Flow rate: 0.5 ml/min
 Temperature: 22 °C
 Detection: UV 226 nm

	α		R _s	
	AmyCoat 3 µm	Chiralpak AD-H*	AmyCoat 3 µm	Chiralpak AD-H*
Ambucetamide	1.4	1.4	4.8	4.2
Carbinoxamine	1.5	1.5	7.3	5.8
Ketoprofen	1.4	1.3	4.6	4.3
Naproxen	1.2	1.2	3.4	3.1
Oxamniquine	1.2	1.2	3.3	3.1
Progumide	2.7	2.8	11.8	9.0
Sulindac	1.3	1.3	4.8	3.9

(* 5 µm)

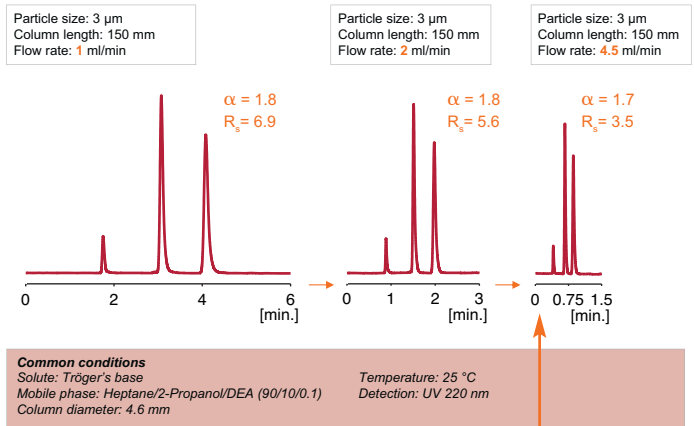
Difference in resolution—Kromasil AmyCoat 3 µm vs. 5 µm.



Common conditions
 Solute: trans-2-Phenyl-1-cyclohexanol
 Mobile phase: Heptane/2-Propanol (95/5)
 Column diameter: 4.6 mm
 Temperature: 25 °C
 Detection: UV 220 nm

Baseline separation by using 3 µm particles

Fast analytical chromatography

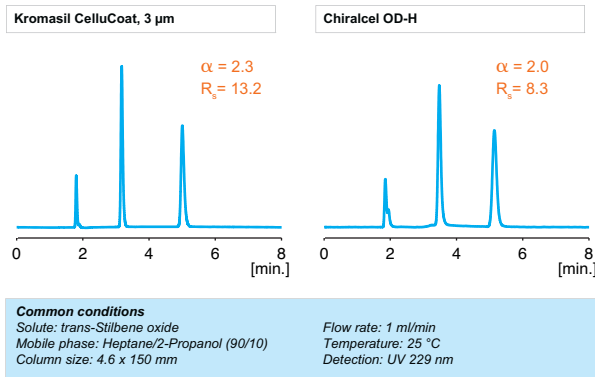


Common conditions
 Solute: Tröger's base
 Mobile phase: Heptane/2-Propanol/DEA (90/10/0.1)
 Column diameter: 4.6 mm
 Temperature: 25 °C
 Detection: UV 220 nm

Baseline separation in less than 1 minute

Kromasil® CelluCoat™

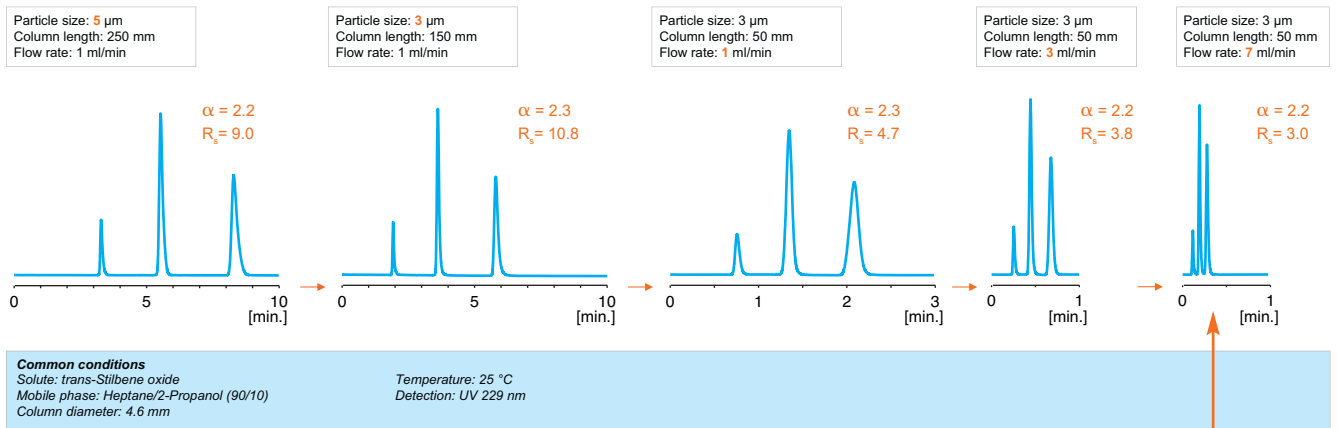
Selectivity and resolution comparison—Kromasil CelluCoat 3 µm and Chiralcel OD-H (5µm).



	α		R_s	
	CelluCoat 3 µm	Chiralcel OD-H*	CelluCoat 3 µm	Chiralcel OD-H*
Trans-Stilbene oxide	2.3	2.0	13.2	8.3
Benzoin	1.5	1.5	8.6	5.7
TFAE	2.9	2.9	14.7	11
Tröger's base	1.4	1.4	3.7	2.7
Oxprenolol	5.6	5.5	18.1	15.1
Naproxen	1.2	1.2	2.9	2.2
Progulmide	2.0	2.0	7.6	3.2

* (5 µm)

Fast analytical chromatography



Baseline separation in less than 30 seconds



Kromasil® AmyCoat™ and Kromasil® CelluCoat™
 —faster results, better results.



Makes everyday work so much easier.

Kromasil AmyCoat and Kromasil CelluCoat let you perform method development without interference from restrictive parameters. Forget pressure limits, long equilibration times and degradation in performance when switching from one compatible mobile phase to another—they simply do not exist anymore.

NO PRESSURE LIMITS

User-friendliness, as we see it, is the ability to perform method development without being restricted by various parameters. One well-known restriction for coated polysaccharide phases is the general pressure limit over the bed. Kromasil AmyCoat and Kromasil CelluCoat withstand flow rates equivalent to pressures up to 400 bar—which is about the limit for the HPLC system itself. This makes it possible to run analytical chromatography a lot faster.

STABLE PERFORMANCE

From a stability perspective, you can run Kromasil AmyCoat and Kromasil CelluCoat using compatible normal, polar organic and reversed mobile phases. Switching between compatible normal to polar organic mobile phases will not lead to any degradation in performance, no need for solvent dedicated columns.

To show the stability in column efficiency for Kromasil CelluCoat, we have performed mobile phase switches and visualized them after each switch with a Knox plot.

SHORT EQUILIBRATION TIMES

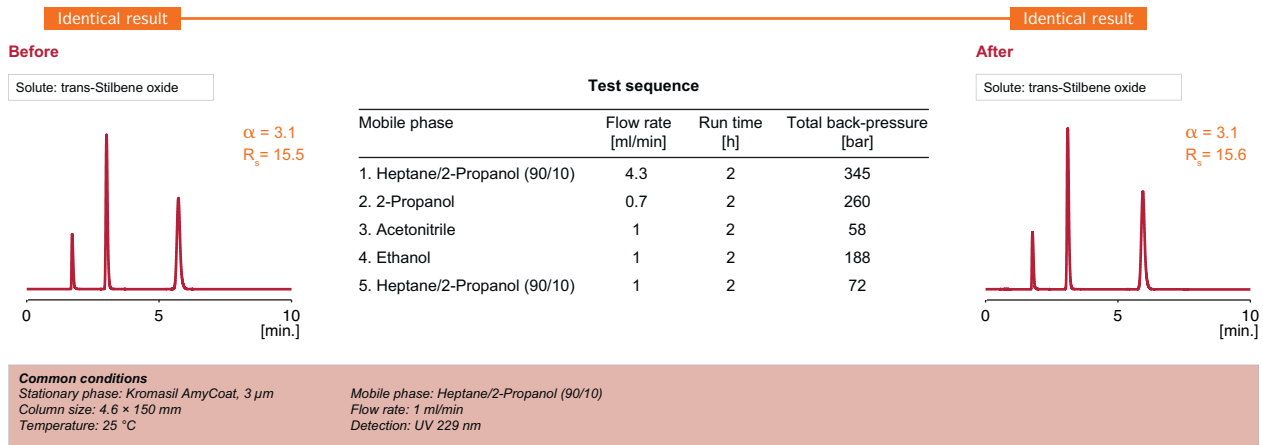
Column equilibration is a time-consuming activity when running chiral chromatography. Higher flow rates allow Kromasil AmyCoat and Kromasil CelluCoat to show substantially shorter equilibration times than other coated phases on the market.

In general, long equilibration times are most pronounced when switching mobile phases containing basic additives to acidic additives or the other way around. The test with a Kromasil CelluCoat 3 μm column switching between two compatible mobile phases shows how short equilibration times you can get.

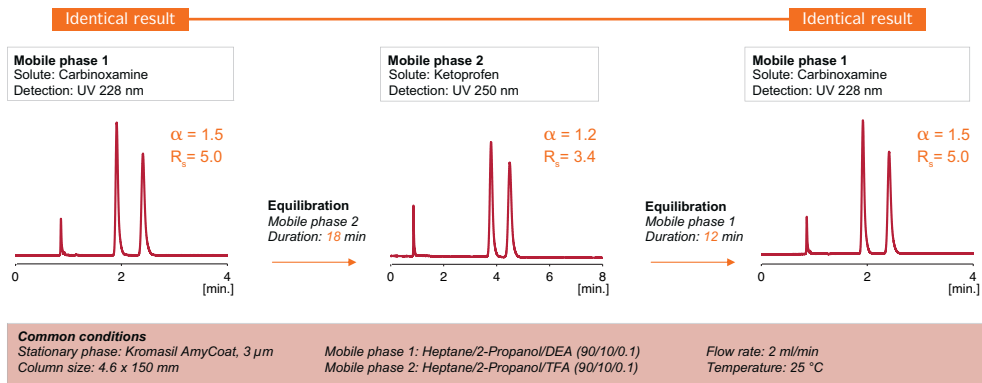
There are also two tests illustrating short equilibration times and additive switch for both Kromasil AmyCoat and Kromasil CelluCoat with absolutely no sign of memory effects.

Kromasil® AmyCoat™

Stable performance—No pressure limits—Freedom to switch solvents

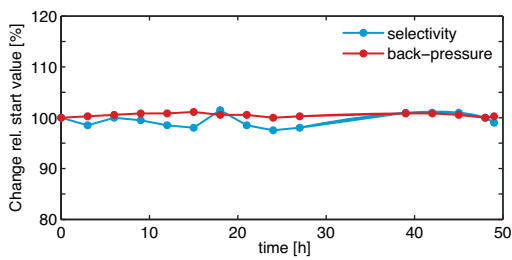


Short equilibration times—Freedom to switch additives

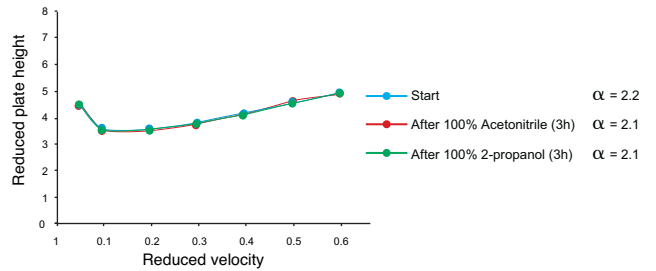


Kromasil® CelluCoat™

Stable performance—No pressure limits—Freedom to switch solvents

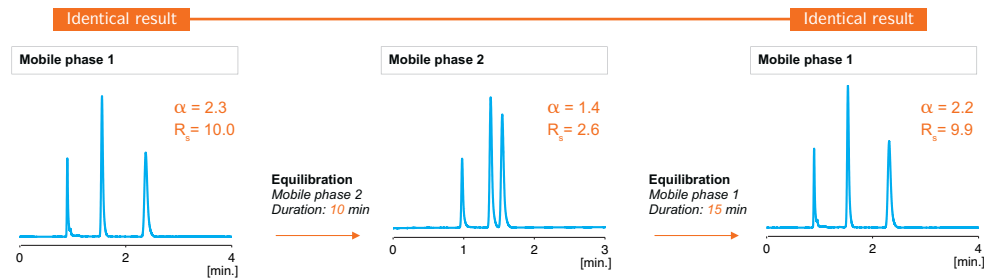


Conditions
 Solute: trans-Stilbene oxide
 Stationary phase: Kromasil CelluCoat, 3 μm
 Column size: 4.6 x 50 mm
 Mobile phase: Heptane/2-Propanol (90/10)
 Flow rate: 7 ml/min
 Temperature: 25 °C



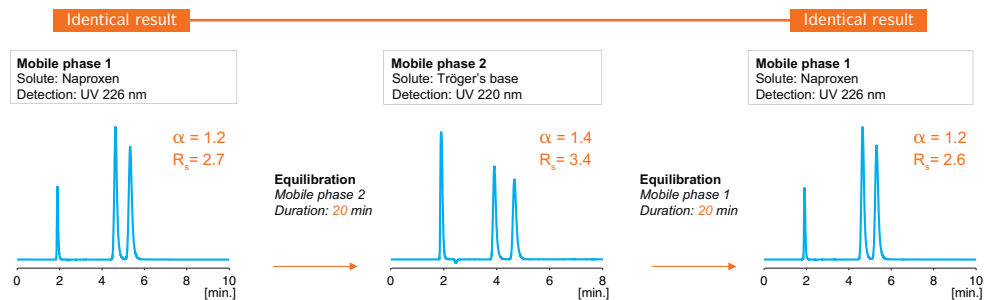
Common conditions
 Solute: trans-Stilbene oxide
 Stationary phase: Kromasil CelluCoat, 5 μm
 Column size: 4.6 x 250 mm
 Mobile phase: Heptane/2-Propanol (90/10)
 Flow rates: 0.1-1.2 ml/min
 Temperature: 25 °C

Short equilibration times—Freedom to switch solvents



Common conditions
 Solute: trans-Stilbene oxide
 Detection: UV 229 nm
 Stationary phase: Kromasil CelluCoat, 3 μm
 Column size: 4.6 x 150 mm
 Mobile phase 1: Heptane/2-Propanol (90/10)
 Mobile phase 2: Ethanol
 Flow rate: 2 ml/min
 Temperature: 25 °C

Short equilibration times—Freedom to switch additives



Common conditions
 Stationary phase: Kromasil CelluCoat, 3 μm
 Column size: 4.6 x 150 mm
 Mobile phase 1: Heptane/2-Propanol/TFA (90/10/0.1)
 Mobile phase 2: Heptane/2-Propanol/DEA (90/10/0.1)
 Flow rate: 1 ml/min
 Temperature: 25 °C



Kromasil®

Works all the way.

Kromasil products are well known for their ability to work along the whole spectrum from analytical to industrial scale chromatography. Kromasil AmyCoat and Kromasil CelluCoat are no exception.

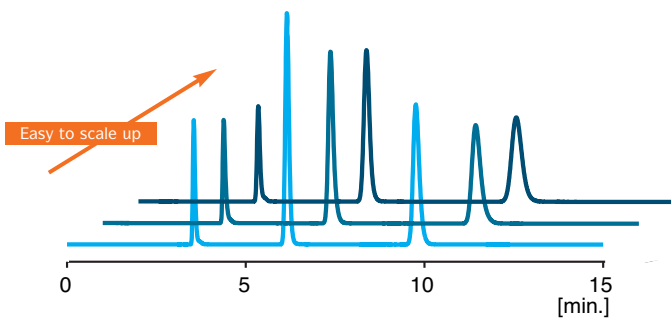
SIMPLIFIES METHOD DEVELOPMENT

With particle sizes from 3 μm to 10 μm giving identical selectivity, Kromasil AmyCoat and Kromasil CelluCoat make it easy to scale up while retaining excellent performance.

As for all Kromasil products, you can perform the required method development in analytical scale columns and then scale up to a larger column.

You can, for example, use 3 μm particles in an analytical scale column and translate all the generated data to a larger column packed with 10 μm particles.

If you plan to scale up the process, we suggest you use an analytical column packed with 10 μm particles right from the start.

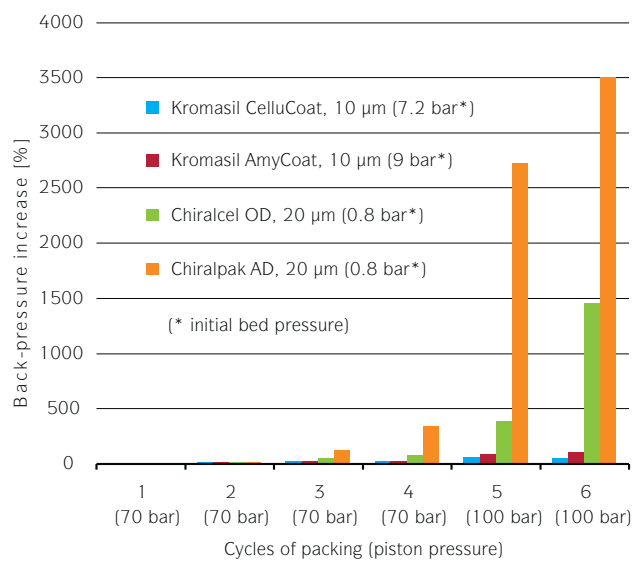


- Kromasil 3-CelluCoat $\alpha = 2.4$ $R_s = 13.9$
- Kromasil 5-CelluCoat $\alpha = 2.4$ $R_s = 11.4$
- Kromasil 10-CelluCoat $\alpha = 2.4$ $R_s = 10.0$

Common conditions
 Column size: 4.6 x 150 mm
 Mobile phase: Heptane/2-Propanol (90/10)
 Flow rate: 0.5 ml/min
 Temperature: 25 °C
 Solute: trans-Stilbene oxide
 Detection: UV 229 nm

MECHANICALLY STRONG

Mechanical strength is an important product lifetime parameter. Kromasil AmyCoat and Kromasil CelluCoat have a mechanically strong spherical silica which withstands repeated cycles of packing.



N.B. The relative back-pressure increase is a measure of the degree of degradation of the material after repeated packings. Actual particle size for Chiralcel and Chiralpak is about 3 times larger than that for Kromasil, which explains the difference in initial back pressure (back-pressure is inversely proportional to the square of the particle size).

The test was designed to exert greater than normal mechanical stress on the chiral stationary phases, and is performed at a packing pressure above the maximum 50 bar recommended by the manufacturer of Chiralcel OD and Chiralpak AD.

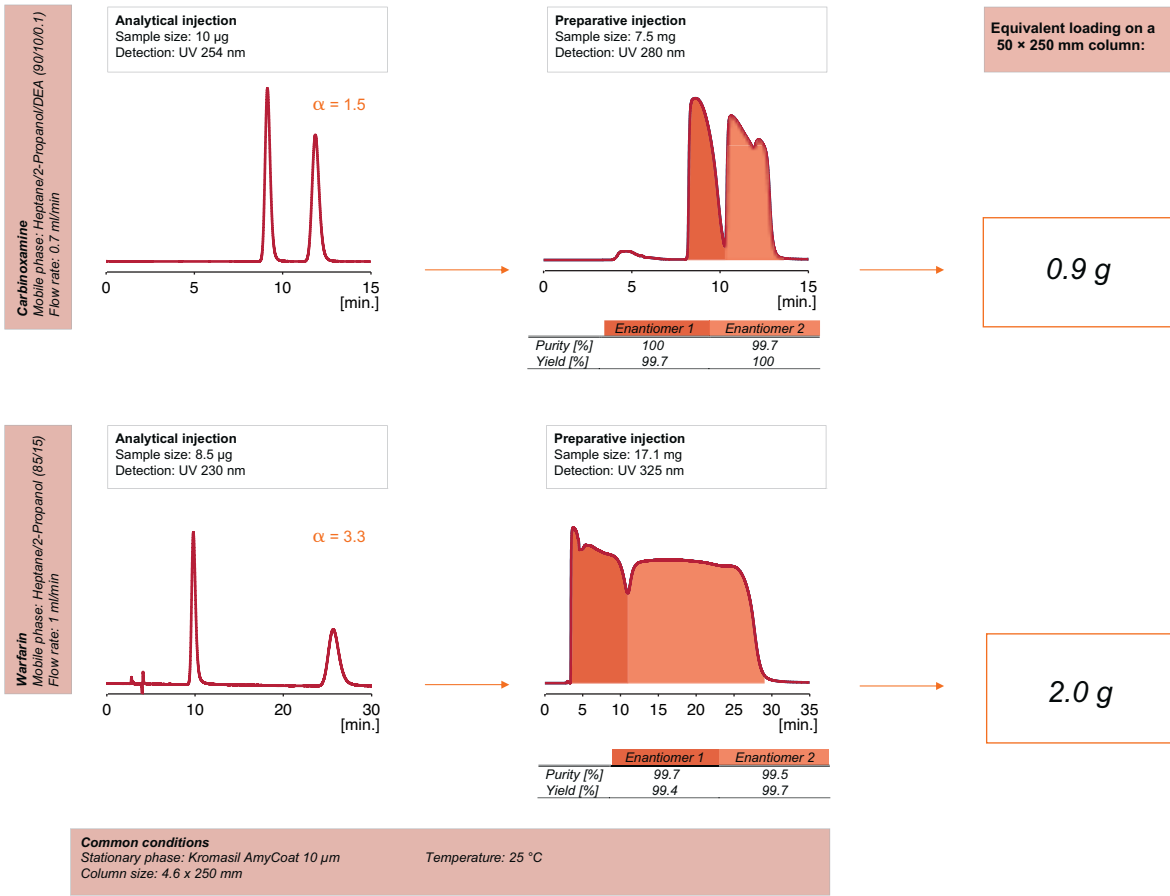
FULLY BACK-INTEGRATED

We manufacture the super wide pore silica for Kromasil polysaccharide products and perform all subsequent steps leading to the final product. This means you get a product with full traceability.

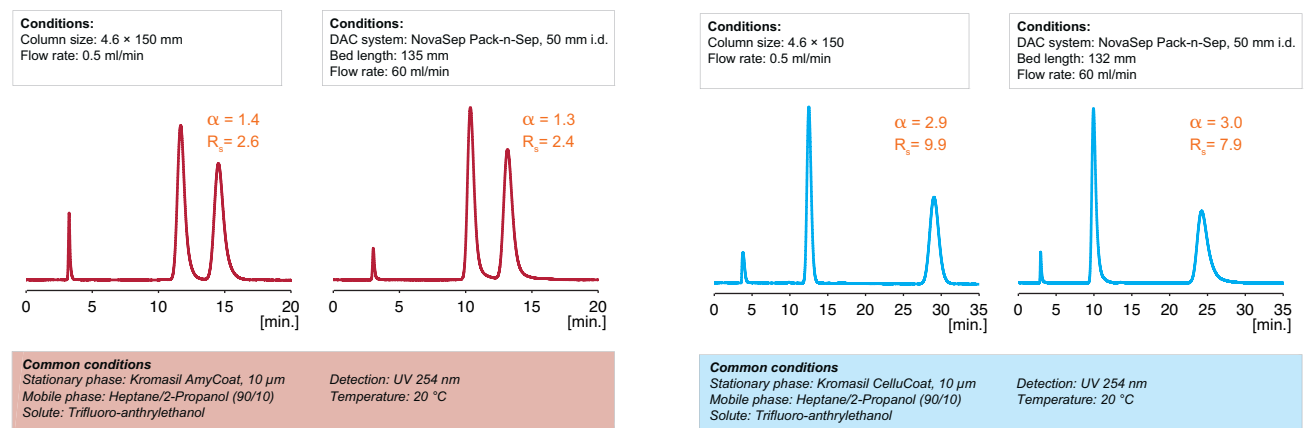
Every manufacturing step is ensured through our detailed quality system, and the final product is never released until it has passed our rigorous quality control tests. Having all the manufacturing steps in-house also gives us a strong position in terms of production capacity.

Kromasil® AmyCoat™

Preparative applications



EASY TO SCALE UP

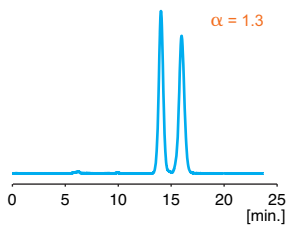


Kromasil® CelluCoat™

Loadability comparison

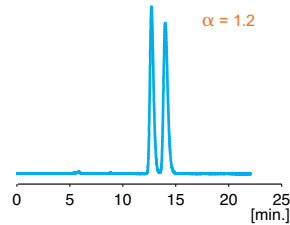
Kromasil CelluCoat, 10 µm

Analytical injection: 20 µg



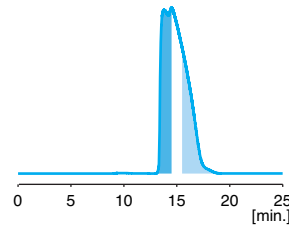
Chiralcel OD, 10 µm

Analytical injection: 20 µg



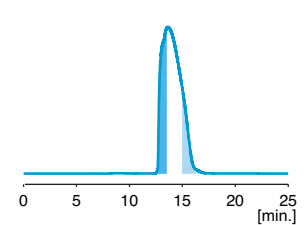
Kromasil CelluCoat, 10 µm

Preparative injection: 5 mg
Collected fractions size: 0.5 min



Chiralcel OD, 10 µm

Preparative injection: 5 mg
Collected fractions size: 0.5 min



	Enantiomer 1		Enantiomer 2	
	Purity [%]	Yield [%]	Purity [%]	Yield [%]
Kromasil CelluCoat	91.2	73.3	94.4	50.1
Daicel Chiralcel OD	91.4	46.7	96.6	24.9

Common conditions

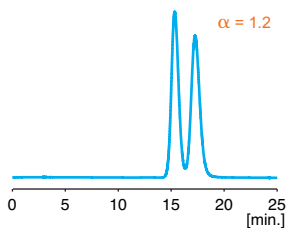
Solute: Naproxen
Mobile phase: Heptane/2-Propanol/TFA (90/10/0.1)
Column size: 4.6 x 250 mm

Temperature: 25 °C
Flow rate: 0.5 ml/min

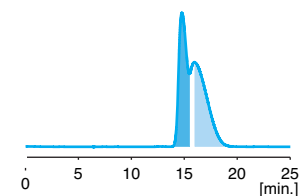
Preparative applications

Binaphтол
Mobile phase: Heptane/2-Propanol (90/10)

Analytical injection
Sample size: 10 µg
Detection: UV 223 nm



Preparative injection
Sample size: 1 mg
Detection: UV 350 nm



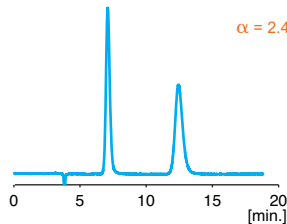
	Enantiomer 1	Enantiomer 2
Purity [%]	95.4	97.8
Yield [%]	91.7	72.8

Equivalent loading on a
50 x 250 mm column:

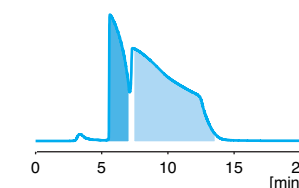
0.1 g

Metoprolol
Mobile phase: Heptane/2-Propanol/DEA (90/10/0.1)

Analytical injection
Sample size: 10 µg
Detection: UV 223 nm



Preparative injection
Sample size: 20 mg
Detection: UV 290 nm



	Enantiomer 1	Enantiomer 2
Purity [%]	100	99.7
Yield [%]	97.9	88.1

2.4 g

Common conditions

Stationary phase: Kromasil CelluCoat, 10 µm
Column size: 4.6 x 250 mm

Temperature: 25 °C
Flow rate: 1 ml/min

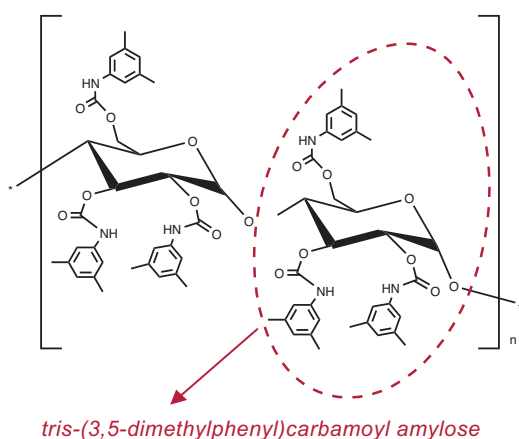


Taking a closer look.

Kromasil® AmyCoat™

CHIRAL SELECTOR

The coated selector is tris-(3,5-dimethylphenyl) carbamoyl amylose.

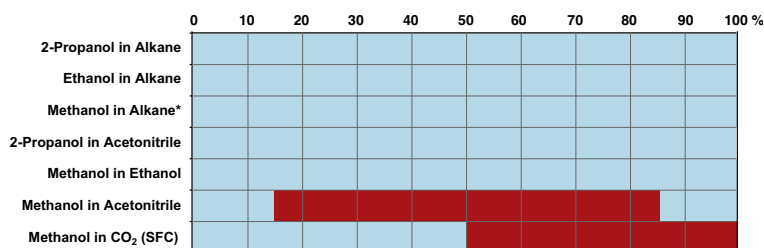


PARTICLE SIZES



Kromasil AmyCoat is available in 3 and 5 µm as pre-packed columns, and in 10 µm as pre-packed column and bulk material.

COMPATIBLE MOBILE PHASES



*Due to limited miscibility of methanol in alkanes, ethanol should be added as a mediator when exceeding 5% methanol.

Compatible conditions Further investigations required

Before testing conditions not mentioned, please contact the Kromasil application group, kromasil@eka.com

PRODUCT ASSORTMENT*

	3 µm - AmyCoat	5 µm - AmyCoat	10 µm - AmyCoat
4.6 x 50 mm	Kromasil 3-AmyCoat 4.6 x 50 mm	Kromasil 5-AmyCoat 4.6 x 50 mm	—
4.6 x 150 mm	Kromasil 3-AmyCoat 4.6 x 150 mm	Kromasil 5-AmyCoat 4.6 x 150 mm	Kromasil 10-AmyCoat 4.6 x 150 mm
4.6 x 250 mm	Kromasil 3-AmyCoat 4.6 x 250 mm	Kromasil 5-AmyCoat 4.6 x 250 mm	Kromasil 10-AmyCoat 4.6 x 250 mm
10 x 250 mm	—	Kromasil-5-AmyCoat 10 x 250 mm	Kromasil-10-AmyCoat 10 x 250 mm
21.2 x 250 mm	—	Kromasil 5-AmyCoat 21.2 x 250 mm	Kromasil 10-AmyCoat 21.2 x 250 mm

* Other column dimensions available upon request.

PRODUCT CODES

Kromasil X-AmyCoat followed by column diameter and length. X indicates particle size: 3, 5 or 10 µm. For example: *Kromasil 3-AmyCoat 4.6 x 150 mm*





ORDERING INFORMATION

Order online at:
www.kromasil.com/online
kromasil@eka.com

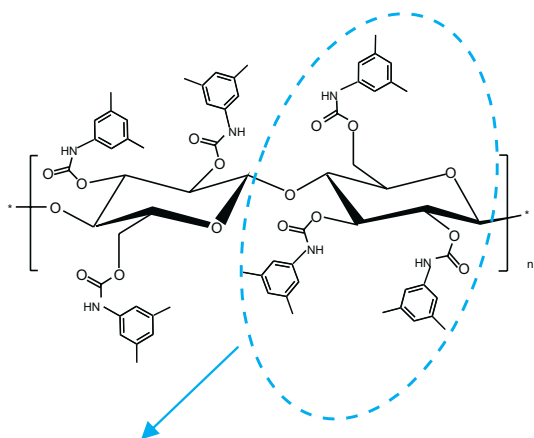
Or contact:
Eka Chemicals, Separation
Products,
SE-445 80 Bohus, Sweden

Tel. +46 31 58 73 60
Fax. +31 58 77 27

Kromasil® CelluCoat™

CHIRAL SELECTOR

The coated selector is tris-(3,5-dimethylphenyl) carbamoyl cellulose.



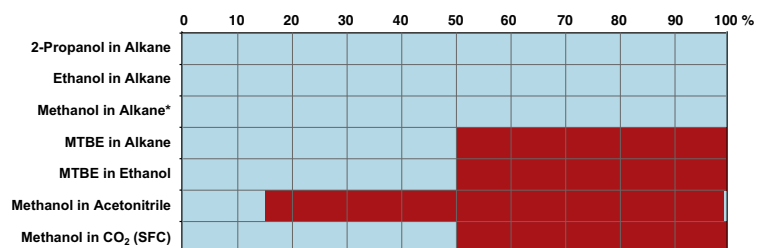
tris-(3,5-dimethylphenyl)carbamoyl cellulose

PARTICLE SIZES



Kromasil CelluCoat is available in 3 and 5 µm as pre-packed columns, and in 10 µm as pre-packed column and bulk material.

COMPATIBLE MOBILE PHASES



*Due to limited miscibility of methanol in alkanes, ethanol should be added as a mediator when exceeding 5% methanol.

Compatible conditions Further investigations required

Before testing conditions not mentioned, please contact the Kromasil application group, kromasil@eka.com

PRODUCT ASSORTMENT*

	3 µm - CelluCoat	5 µm - CelluCoat	10 µm - CelluCoat
4.6 x 50 mm	Kromasil 3-CelluCoat 4.6 x 50 mm	Kromasil 5-CelluCoat 4.6 x 50 mm	—
4.6 x 150 mm	Kromasil 3-CelluCoat 4.6 x 150 mm	Kromasil 5-CelluCoat 4.6 x 150 mm	Kromasil 10-CelluCoat 4.6 x 150 mm
4.6 x 250 mm	Kromasil 3-CelluCoat 4.6 x 250 mm	Kromasil 5-CelluCoat 4.6 x 250 mm	Kromasil 10-CelluCoat 4.6 x 250 mm
10 x 250 mm	—	Kromasil-5-CelluCoat 10 x 250 mm	Kromasil-10-CelluCoat 10 x 250 mm
21.2 x 250 mm	—	Kromasil 5-CelluCoat 21.2 x 250 mm	Kromasil 10-CelluCoat 21.2 x 250 mm

* Other column dimensions available upon request.

PRODUCT CODES

Kromasil X-CelluCoat followed by column diameter and length. X indicates particle size: 3, 5 or 10 µm. For example: *Kromasil 3-CelluCoat 4.6 x 150 mm*

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 3,000 people in 30 countries. It is a business unit within Akzo Nobel, one of the world's largest chemical groups, with more than 67,000 employees in 80 countries.

Eka Chemicals AB

Separation Products

SE-445 80 Bohus, Sweden

Telephone + 46 31 58 73 60

Fax + 46 31 58 77 27

For NAFTA countries:

Akzo Nobel/Kromasil

281 Fields Lane, Brewster

NY 10509-2676, USA

Telephone + 1 845 276 8223

kromasil@eka.com

www.kromasil.com

Kromasil®

