Kromasil®
SFC

Kromasil SFC

Designed for green technology

Nouryon

Columns for efficient SFC

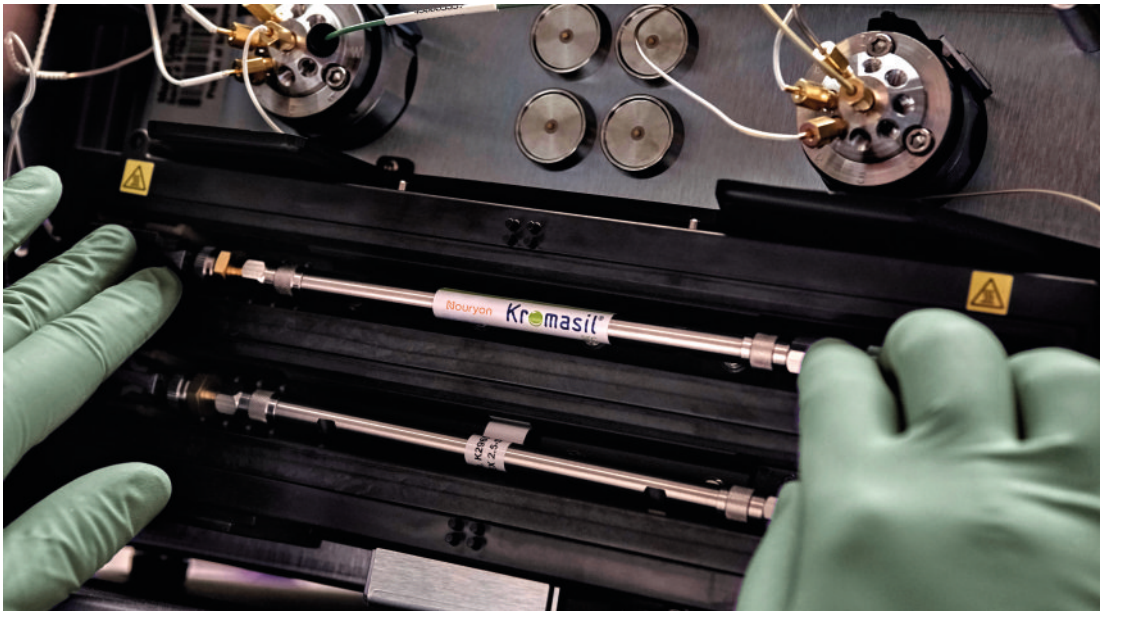
Supercritical Fluid Chromatography (SFC) is an alternative for separating and purifying substances and is regarded as a green chemistry technology. The advantage of SFC is that it's a low-cost technique with carbon dioxide as main eluent, using only small amounts of organic solvents as modifier.

The natural choice

Briefly, carbon dioxide is the main component of the SFC mobile carrier, which can be accompanied by small percentages of modifiers such as methanol. The use of mostly carbon dioxide is seen as an environmentally sound approach. It is also a way to reduce operating costs in the laboratory as the cost of carbon dioxide is significantly lower than acetonitrile or methanol.

In addition, due to the physics involved, SFC is a tool for quick sample turnaround. This is especially true when moving to drug development and production, where the user can minimize eluent evaporation time in the fractions collected, increasing overall productivity in the laboratory and manufacturing.

Based on Kromasil silica particles, the Kromasil superficial fluid chromatography (SFC) platform is a set of columns that meets the increased interest for green technologies and sustainable solutions in the laboratory.



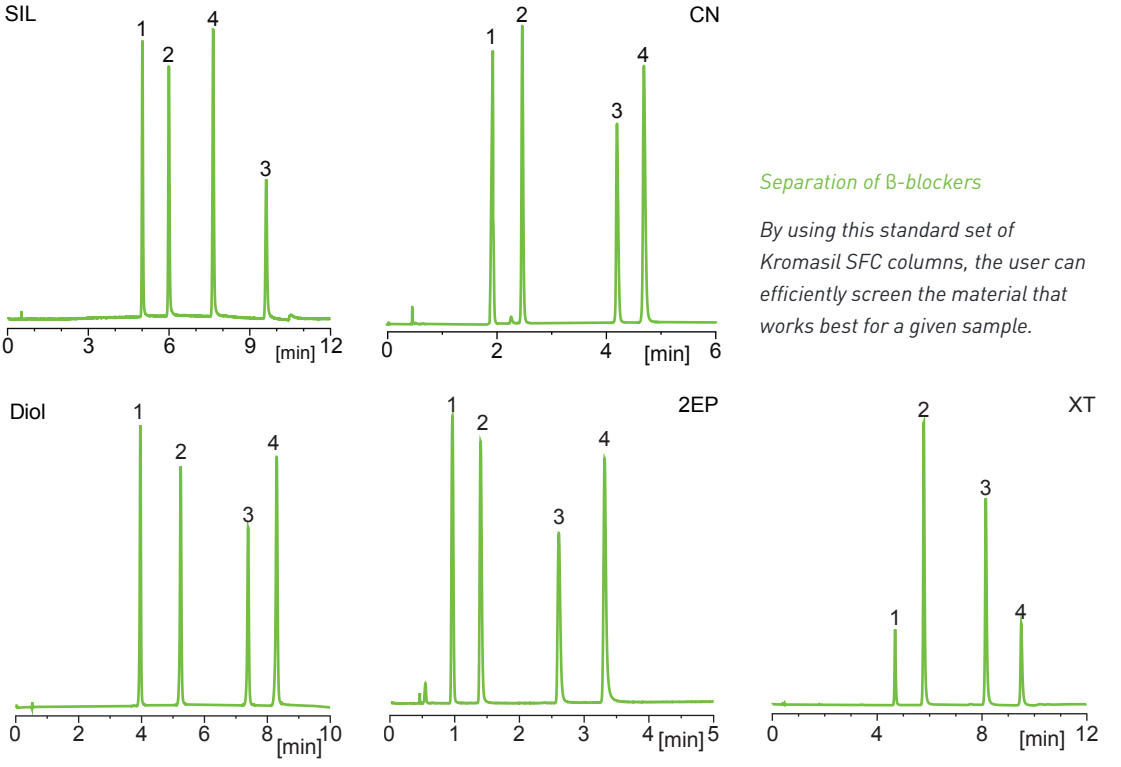
SFC columns for analysis and isolation

Based on 100 Å pore size, 2.5 and 5 µm particles, Kromasil SFC columns gives users the opportunity of fast separations. The columns are tailor-made for research, discovery and routine analysis.

Many options

Kromasil SFC columns are the answer for fast separations. These columns are offered in five options for your best fit of selectivity, cyano, diol, silica, 2-ethylpyridine and organo-silane chemistries, for the laboratory scientist to separate a wide range of substances, from non-polar to strongly polar compounds.

The stationary phase quintet



Separation of ß-blockers

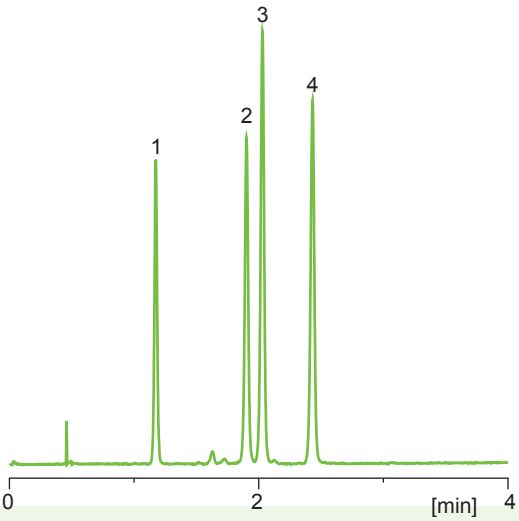
By using this standard set of Kromasil SFC columns, the user can efficiently screen the material that works best for a given sample.

Conditions

Stationary phases: Kromasil SFC, 2.5 µm phase chemistry as in figure
Column size: 3.0 x 150 mm
Part numbers: FH2SIC15, FH2CNC15, FH2DIC15, FH2EPC15 and FH2XTC15
Mobile phase: CO_2 / methanol + 20 mM ammonia
Gradient: 0 min: 5%, 10 min: 30% methanol
Flow rate: 2.0 ml/min
Temperature: 40°C
Outlet pressure: 120 bar
Detection: ES-MS and UV @ 220 nm
Substances: 1 = alprenolol, 2 = propranolol
3 = acebutolol, 4 = pindolol

Fast separations

Medium and high throughput laboratories working with green technology and seeking to improve turnaround time can take advantage of the separation power of the Kromasil SFC 2.5 µm family of columns.



Separation of steroids

With the chromatographic power of Kromasil SFC cyano phase users can easily achieve baseline resolution within 2.5 minutes of a generic linear gradient.

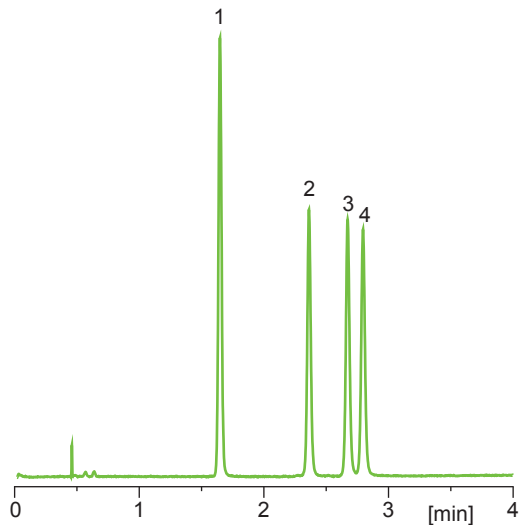
Conditions

Column: Kromasil SFC, 2.5 µm, CN, 3.0 x 150 mm
Part number: FH2CNC15
Mobile phase: CO_2 / methanol
Gradient: 0 min: 5%, 10 min: 30% methanol
Flow rate: 2 ml/min

Temperature: 40 °C
Outlet pressure: 120 bar
Detection: ES-MS and UV @ 220 nm
Substances: 1 = deoxycorticosterone, 2 = corticosterone, 3 = cortisone, 4 = hydrocortisone

Selectivity for SFC

Users of SFC find the technique useful for fast separations and look for Kromasil SFC phases because of their potential for base line resolution between key compounds..



Separation of anti-inflammatory drugs

With its endcapping and aromatic properties, Kromasil SFC with 2-ethylpyridine offers a unique separation power that makes it standout from the rest.

Conditions

Column: Kromasil SFC, 2.5 µm, 2EP, 3.0 x 150 mm
Part number: FH2EPC15
Mobile phase: CO_2 / methanol
Gradient: 0 min: 5%, 10 min: 30% methanol
Flow rate: 2 ml/min

Temperature: 40°C
Outlet pressure: 120 bar
Detection: ES-MS and UV @ 220 nm
Substances: 1 = ibuprofen, 2 = fenoprofen, 3 = flurbiprofen, 4 = ketoprofen

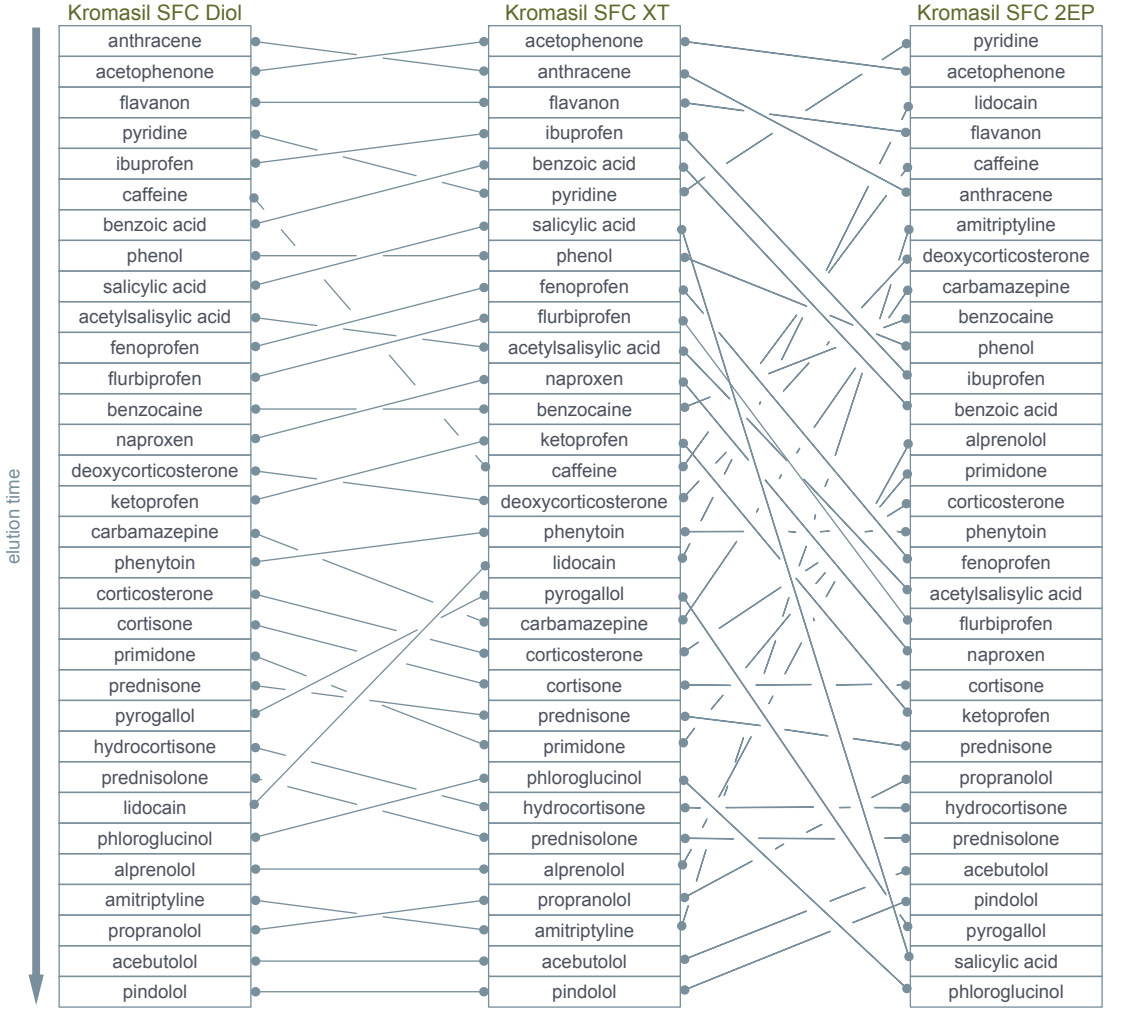
Note: Application results and chromatograms on this SFC spread are courtesy of AstraZeneca, Mölndal, Sweden.

Orthogonal phases for all challenges

In general, the 2EP functionality is known for its benefits in terms of selectivity and retention in SFC, and it has the specific benefits towards the separation of basic compounds, where peak shape is significantly improved. Therefore the 2EP chemistry is seen as the workhorse for SFC

With Kromasil SFC XT we can offer a SFC phase that greatly compliments 2EP showing orthogonality towards 2EP and other common SFC phases when run under standard SFC conditions. This new material provides additional tools to SFC users around the world.

Elution order for common acidic, neutral and basic substances on selected SFC phases.
Relative elution time increases downwards in the figure.



Conditions

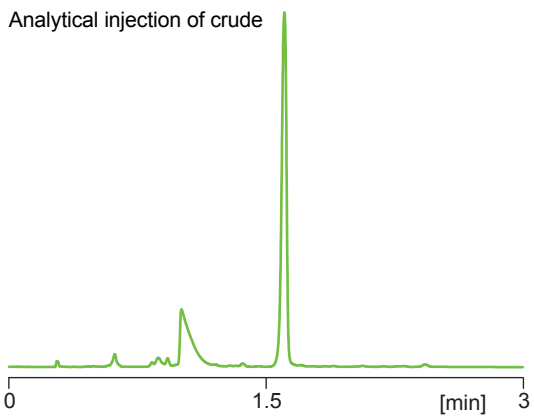
Stationary phases: Kromasil SFC, 2.5 µm, phase chemistries as in table
Column size: 3.0 x 150 mm
Part numbers: FH2DIC15, FH2XTC15 and FH2EPC15

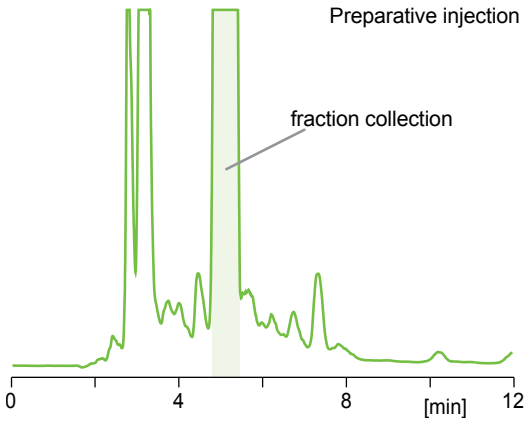
Mobile phase: CO_2 / methanol
Gradient: 0 min: 5%, 15 min: 30% methanol
Flow rate: 1.5 ml/min
Temperature: 40°C

Outlet pressure: 110 bar
Detection: UV @ 254 nm

Scale up your purification with SFC

Because of the high surface availability of our SFC line, our materials show great loadability which makes them excellent choices for preparative purification under overloaded conditions.





Analytical conditions
Column: Kromasil SFC-2.5-XT 3.0 x 100 mm (p.n. FH2XTC10)
Mobile phase: CO_2 / methanol
Gradient: 0 min: 10%, 3 min: 20% methanol
Flow rate: 2.0 ml/min
Temperature: 40°C
Outlet pressure: 120 bar
Detection: UV @ 230 nm

Preparative conditions
Column: Kromasil SFC-5-XT 10 x 250 mm (p.n. F05XTP25)
Mobile phase: CO_2 / 20% methanol
Loading: 16 mg
Flow rate: 8.0 ml/min
Temperature: 40°C
Outlet pressure: 100 bar
Detection: UV @ 254 nm

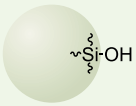
Kromasil SFC - product characteristics

Kromasil SFC is based on first-in-class, perfectly spherical, porous Kromasil silica particles with 100 Å pore size and particle sizes of 2.5 and 5 µm. Furthermore, Kromasil SFC XT is the result of a patented organic/inorganic merged silica technology.

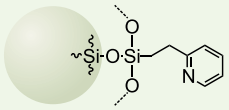
Particle size distribution *(Coulter Multisizer)*:
dv_{90}/dv_{10}: 5 µm <1.55
2.5 µm <1.40
Chemical purity *(AAS or ICP)*:
Na <10 ppm, Al < 5 ppm, Fe < 5 ppm
Specific surface area *(multi-point BET)*: 320 m²/g

Pore volume *(N_2-adsorption)*: 0.9 ml/g
Pore size *(N_2-adsorption)*: 110 Å
Pore size distribution *(N_2-adsorption)*: 80% ± 25 Å
(97% of the surface is accessible for toluene, which indicates low amounts of inaccessible micropores.)
Fully encapped.

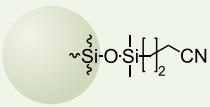
SIL
Bare silica
USP: L3
Packed density: 0.50 g/ml



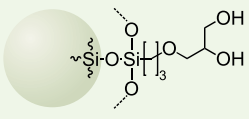
2EP
2-ethylpyridine
Coverage: 3.8 µmol/m²
Element content: 1.7% N
Packed density: 0.53 g/ml



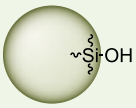
CN
Cyano
USP: L10
Coverage: 4.0 µmol/m²
Element content: 12% C and 3.8% N
Packed density: 0.48 g/ml



Diol
USP: L20
Coverage: 3.5 µmol/m²
Element content: 7% C
Packed density: 0.53 g/ml



XT
Fused organo-silane



Availability

Please check the tables with part numbers in the availability of this guide.

Ordering Kromasil SFC products

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F +1 845 277 1406

e-mail: kromasil@nouryon.com
web: www.kromasil.com

Find a distributor:

www.kromasil.com/distributor_network

Kromasil SFC bulk media

		Particle size, [µm]	
		2.5	5
SFC	SIL	FH2SIblk	F05SIblk
SFC	Diol	●	●
SFC	CN	●	●
SFC	2EP	●	●
SFC	XT	●	●

● : analytical product, only available in slurry-packed columns
● : bare silica product in analytical particle sizes available in bulk for contracted OEM producers

Kromasil SFC, 3.0 mm i.d. columns

			column size, i.d. × length [mm]			
Family	Phase	particle size [µm]	3.0 × 50	3.0 × 100	3.0 × 150	3.0 × 250
SFC	SIL	2.5	FH2SIC05	FH2SIC10	FH2SIC15	
SFC	SIL	5		F05SIC10	F05SIC15	F05SIC25
SFC	Diol	2.5	FH2DIC05	FH2DIC10	FH2DIC15	
SFC	Diol	5		F05DIC10	F05DIC15	F05DIC25
SFC	CN	2.5	FH2CNC05	FH2CNC10	FH2CNC15	
SFC	CN	5		F05CNC10	F05CNC15	F05CNC25
SFC	2EP	2.5	FH2EPC05	FH2EPC10	FH2EPC15	
SFC	2EP	5		F05EPC10	F05EPC15	F05EPC25
SFC	XT	2.5	FH2XTC05	FH2XTC10	FH2XTC15	
SFC	XT	5		F05XTC10	F05XTC15	F05XTC25
SFC	KIT	2.5			FH2FKC15	

Kromasil SFC, 4.6 mm i.d. columns

			column size, i.d. × length [mm]			
Family	Phase	particle size [µm]	4.6 × 50	4.6 × 100	4.6 × 150	4.6 × 250
SFC	SIL	2.5	FH2SIA05	FH2SIA10	FH2SIA15	
SFC	SIL	5		F05SIA10	F05SIA15	F05SIA25
SFC	Diol	2.5	FH2DIA05	FH2DIA10	FH2DIA15	
SFC	Diol	5		F05DIA10	F05DIA15	F05DIA25
SFC	CN	2.5	FH2CNA05	FH2CNA10	FH2CNA15	
SFC	CN	5		F05CNA10	F05CNA15	F05CNA25
SFC	2EP	2.5	FH2EPA05	FH2EPA10	FH2EPA15	
SFC	2EP	5		F05EPA10	F05EPA15	F05EPA25
SFC	XT	2.5	FH2XTA05	FH2XTA10	FH2XTA15	
SFC	XT	5		F05XTA10	F05XTA15	F05XTA25

Kromasil SFC, 10 mm i.d. columns

Family	Phase	particle size [µm]	column size, i.d. × length [mm] 10 × 150	10 × 250
SFC	SIL	5	F05SIP15	F05SIP25
SFC	Diol	5	F05DIP15	F05DIP25
SFC	CN	5	F05CNP15	F05CNP25
SFC	2EP	5	F05EPP15	F05EPP25
SFC	XT	5	F05XTP15	F05XTP25

Kromasil SFC, 21.2 mm i.d. columns

Family	Phase	particle size [µm]	column size, i.d. × length [mm] 21.2 × 150	21.2 × 250
SFC	SIL	5	F05SIQ15	F05SIQ25
SFC	Diol	5	F05DIQ15	F05DIQ25
SFC	CN	5	F05CNQ15	F05CNQ25
SFC	2EP	5	F05EPQ15	F05EPQ25
SFC	XT	5	F05XTQ15	F05XTQ25

Kromasil SFC, 30 mm i.d. columns

Family	Phase	particle size [µm]	column size, i.d. × length [mm] 30 × 150	30 × 250
SFC	SIL	5	F05SIR15	F05SIR25
SFC	Diol	5	F05DIR15	F05DIR25
SFC	CN	5	F05CNR15	F05CNR25
SFC	2EP	5	F05EPR15	F05EPR25
SFC	XT	5	F05XTR15	F05XTR25

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 eld of silica products. For the past 70 years, we have pioneered new types of silica. Our long experience in the eld of silica chemistry is the secret behind the development of Kromasil, and the success of our Separation Products group. Kromasil is available in bulk and in high-pressure slurry-packed columns.

The production of Kromasil is ISO 9001 and 14001 certified.

Kromasil is a brand of Nouryon, a global specialty chemicals leader. Industries worldwide rely on our essential chemistry in the manufacture of everyday products. Building on our nearly 400-year history and operations in over 80 countries, the dedication of our 10 000 employees, and our shared commitment to safety, sustainability, and innovation, we have established a world-class business and built strong partnerships with our customers.

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