BEKOlut®
YOUR PARTNER FOR SMART SPE SOLUTIONS

bekolut

FEEL FREE TO USE QUALITY!

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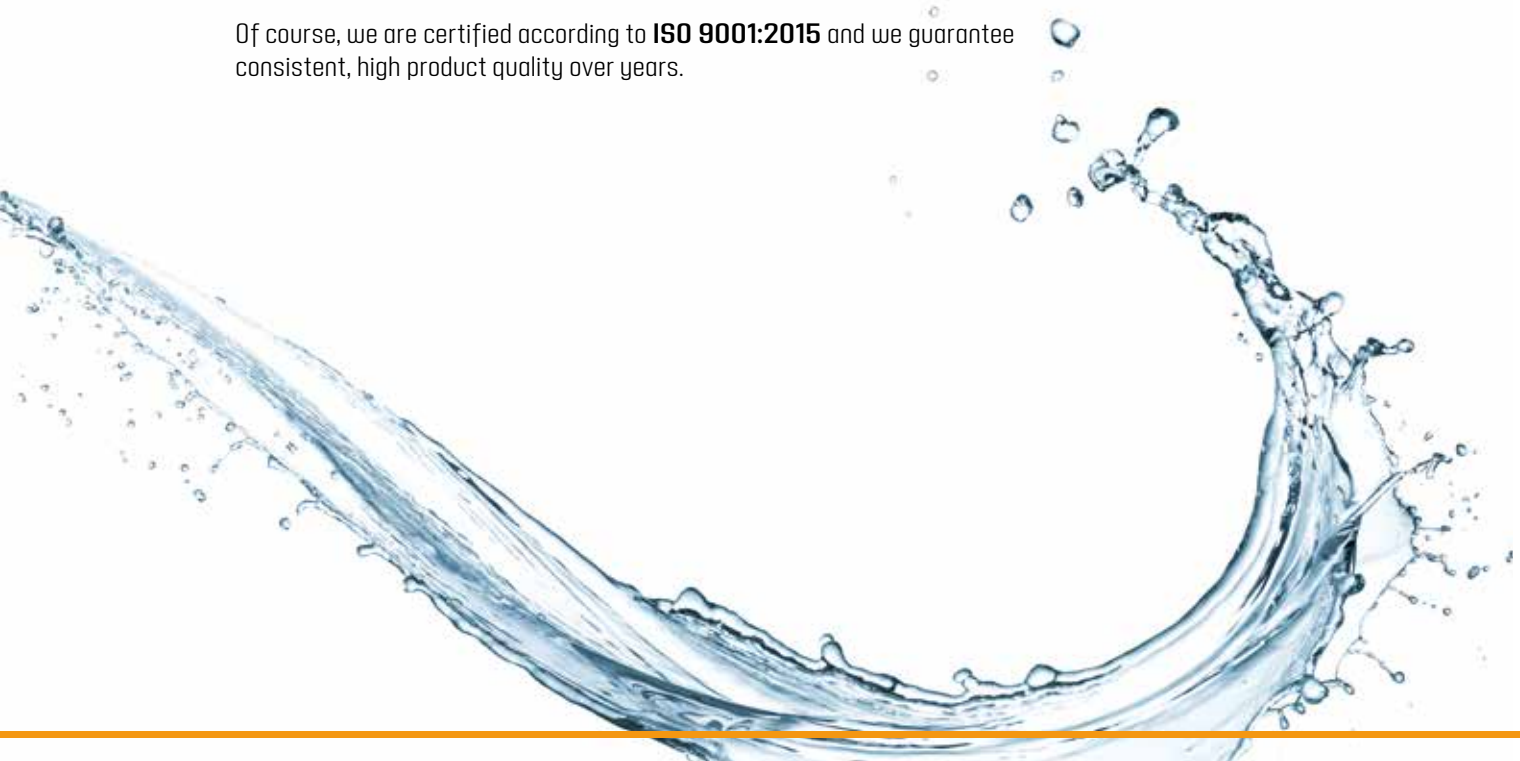
WELCOME TO BEKOlut® – YOUR PARTNER FOR SMART SPE SOLUTIONS

BEKOlut®
SPE

BEKOlut GmbH & Co. KG develops and manufactures products for solid–phase extraction (SPE) , QuEChERS and Filtration. Even for small product lines, we offer convincing solutions in no time. Our product range comprises standard and customized SPE cartridges with silica or polymer particles.

As a company producing in and selling from Germany, we are able to offer the flexibility required to meet your requests fast and efficiently – from exceptional dimensions to slurry–packed cartridges.

Of course, we are certified according to **ISO 9001:2015** and we guarantee consistent, high product quality over years.



BEKOlut® SPE – ROBUST & REPRODUCIBLE – WHAT YOU CAN EXPECT

01	Premium SPE Cartridges with highest and **tested purity** of all components (sorbents, frits, cartridge housing)
02	We are the only supplier worldwide of inert, high purity plastic SPE cartridges – as an **alternative** to **glass columns**
03	Reservation of a required batch – in the case of **big ordering volumes**
04	Perfect **customer care** and delivery **service**
05	**Customized solutions**, especially for automated SPE in the field of multi–component residue analysis
06	Outstanding **quality** Made in Germany at best prices
07	Excellent **reproducibility** from batch–to–batch for years

OUR CORE COMPETENCIES

BEKOlut®
SPE

01 Production of cartridges, filtration units and filter discs (frits), of **highest quality and purity** and in various dimensions and porosities.

02 **Professional expertise** in the development of innovative filtration products or plastic devices (cartridges, adaptors, caps, etc.)

03 "According to our company's philosophy, **product quality and service** must be right and meet your demands."
Günter Porwol, CEO

OUR SERVICES

We offer customized manufacturing of SPE products. Do you want SPE columns with sorbents, sorbent bed quantities or other configurations that are not in our standard program? Then please contact us at **info@bekolut.de**

In case you get nowhere with your method development or if you might have specific application requests, our application support will be **immediately** and **24/7** available for you.

BEKOlut®
SPE

OUR QUALITY STANDARD

BEKOLUT* SPE cartridges are made in Germany applying a DIN EN ISO 9001 certified quality management system.

As a family business, we are able to manufacture **cost–effectively** – without compromising our high quality standards. This cost saving helps to reduce the analysis costs in your laboratory.

WHAT YOU CAN EXPECT

TOP QUALITY IS OUR CREDO

You can rely on it. In addition to the high quality of our products – Made in Germany, we greatly value friendliness, punctuality and a strong service orientation.

ABSOLUTE RELIABILITY IS OUR PROMISE

Be certain. We are your reliable partner when it comes to quality, on–time delivery and customer service. Your satisfaction is our motivation and we ensure it by precisely tailoring our production to your needs.

THE HIGHEST LEVEL OF FLEXIBILITY FOR EXCEPTIONAL CHALLENGES IS OUR MOTIVATION

Challenge us. We even take–on unconventional and unusual requests with extraordinary commitment. This allows us to react quickly and straightforward when circumstances change. Some of our strengths are high purity sorbents and frits as well as high purity plastic SPE columns and special glass columns.

SHORT PATHS IN OUR COMPANY FOR TURBO – FAST SERVICE AND DELIVERY

BEKOlut® GmbH & Co.KG is a **family business.** The company processes are characterised by flat hierarchical structures. Our employees work with initiative and responsibility. This allows us to process your orders quickly and successfully without complications.

BEKOlut®
SPE

YOUR SATISFACTION IS OUR TOP PRIORITY

Challenge us. **We can make it possible**.
With our experience of more than 25 years in SPE, our engagement and commitment to tackle the challenges you face, we find innovative solutions that meet your applications, challenges, wishes and expectations.

WE SPECIALIZE FOR YOUR BENEFIT

We certainly manufacture standard products, but **expect something special from us**. From our earliest beginnings, we have focused on manufacturing premium SPE and sample filtration products.
For each individual new project, our main focus is the **implementation** of **your requirements**.

OUR FUTURE FOR YOUR ADVANCEMENT

We are constantly modernizing and developing our machinery, so that we keep it more than state of the art. Meeting your **wishes** and **requirements** is our goal. We are looking forward to develop your future applications, extending our range, in close collaboration with you.

THE KEY TO REPRODUCIBLE SOLID–PHASE EXTRACTION

The number of samples to be tested is constantly increasing. Keeping meticulous control of important parameters helps to ensure product features, to avoid damage and to preserve our quality of life. In order to fully exploit the possibilities of instrumental analysis, in particular of LC–MS/MS, samples must be specifically prepared. This is often the most time consuming and critical step in the overall analysis. **Selective solid–phase extraction** ensures efficient, economical and meaningful analyses.

Because solid–phase extraction is based on the principles of adsorption and desorption, either analytes or matrix materials are adsorbed. Selective extraction is achieved by a strong but reversible interaction of the analyte with the surface of the stationary phase. Essentially, these three different mechanisms are relevant: **normal–phase, reversed–phase and ion–exchange**.

A suitable sample pre–treatment before the actual solid phase extraction is appropriate. For example, adjustment of the pH or diluting the sample solution might contribute to altering the differences between the analytes and the matrix, so that a selective SPE is possible. For the **SPE, four steps** are required, which must be optimized in each case with respect to the quantitative recovery of the analyte(s) and monitored at intervals for a given procedure.

BEKOlut®
SPE

ELUTION

4. In the last step, the compounds to be determined are eluted with a suitable solvent. The solvent should be chosen in order to weaken the interaction between the analyte and the sorbent and to ensure a distribution of the analyte in the solvent. It should not be eluted too rapidly.

WASHING / DRYING

3. In reversed–phase SPE, adsorbed matrix components are removed by washing with a small volume of water or buffer solution. In doing so, the adsorbed analytes must not be washed from the column. The drying step should be performed under reproducible conditions, e.g. with a nitrogen stream.

SAMPLE APPLICATION

2. The sample solution is applied slowly and under defined conditions. Ideally, the substance to be determined is concentrated as a narrow zone on the column head. Matrix components are ideally not adsorbed and pass the column during sample application.

CONDITIONING

1. For non–polar RP phases, initially a solvatation with acetonitrile or methanol is required, followed by conditioning with the solvent in which the analytes are dissolved. In each case, 2–3 times the column volume is used. The cartridge must not run dry – a necessary pre–requisite for reproducible adsorption of the analytes.

WHICH SPE CARTRIDGE FOR WHICH SAMPLE?

ION–EXCHANGE SPE

Water soluble, ionic analytes in aqueous sample solution

Analytes	Stationary Phase	Elution
Silica based		
Weakly basic cations, basic drugs	**BEKOlut® SCX** strongly acidic cation exchanger (silica based)	Preferably organic basic (neutralizing the analyte)
Small water–soluble, e.g. Acrylamide from food	**BEKOlut® Multimode**	Interference components (acidic, basic and non–polar) are retained, while the analyte is passing through the column to be collected
Weakly acidic anions, acidic drugs	**BEKOlut® SAX:** strongly basic anion exchanger (silica based)	Preferably organic acidic (neutralizing the analyte)
Strongly acidic anions, sulfonic acids	**BEKOlut® NH_2 and PSA:** weakly basic anion exchangers (silica based)	Preferably organic basic (neutralizing the sorbent)
Polymer based		
Weakly basic cations, basic drugs	**BEKOlut® Leox® CX:** strongly acidic cation exchange resin (polymer based)	Preferably organic basic (neutralizing the analyte)
Strongly basic cations, strongly basic analytes	**BEKOlut® Leox® WCX:** weakly acidic cation exchange resin (polymer based)	Preferably organic acidic (neutralizing the sorbent)

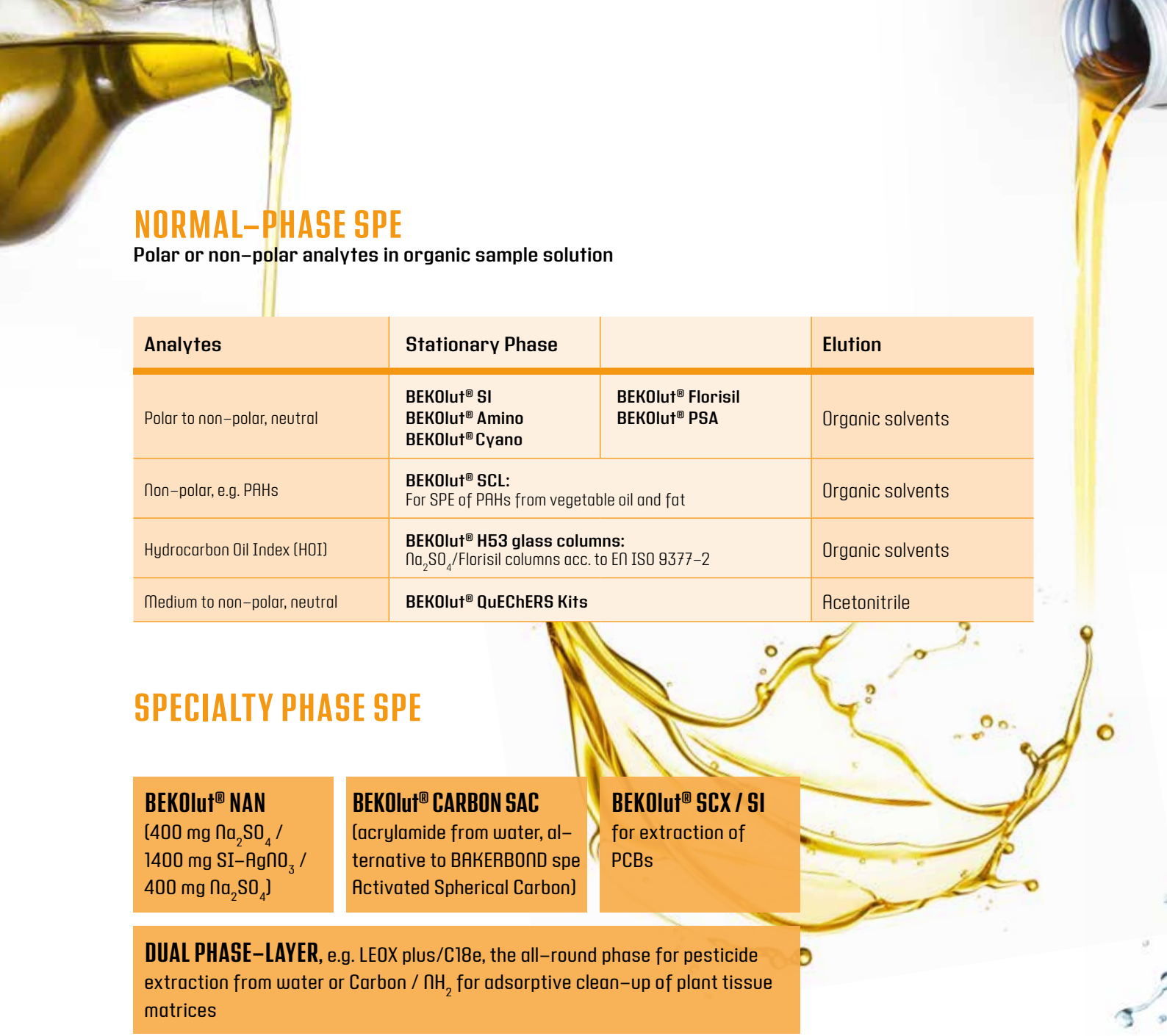
BEKOlut®
SPE

Analytes	Stationary Phase	Elution
Weakly acidic anions, acidic drugs	**BEKOlut® Leox® AX:** strongly basic anion exchange resin (polymer based)	Preferably organic acidic (neutralizing the analyte)
Strongly acidic anions, sulfonic acids	**BEKOlut® Leox® WAX:** weakly basic anion exchange resin (polymer based)	Preferably organic ammonia containing (neutralizing the sorbent)

REVERSED–PHASE SPE

Polar or non–polar analytes in aqueous sample solution

Analytes	Stationary Phase	Elution
Polar to non–polar, neutral	**BEKOlut® Leox® and Leox® Plus** (Polymeric phases with graduated analyte capacity and broad selectivity)	Methanol, acetonitrile, possibly with addition of acid or base
Acidic, neutral and basic, mainly polar	**BEKOlut® HLB**	Methanol, acetonitrile
Acidic, neutral and basic, mainly polar	**BEKOlut® HLBXtra**	Methanol, acetonitrile possibly with addition of acid
Highly non–polar, in particular PAHs	**BEKOlut® SCL** for SPE of PAHs from water	Acetonitrile, n–hexane
Medium to non–polar, neutral	**BEKOlut® C8, C18, C18e, Cyano**	Methanol, acetonitrile, n–hexane



NORMAL–PHASE SPE

Polar or non–polar analytes in organic sample solution

Analytes	Stationary Phase		Elution
Polar to non–polar, neutral	**BEKOlut® SI** **BEKOlut® Amino** **BEKOlut® Cyano**	**BEKOlut® Florisil** **BEKOlut® PSA**	Organic solvents
Non–polar, e.g. PAHs	**BEKOlut® SCL:** For SPE of PAHs from vegetable oil and fat		Organic solvents
Hydrocarbon Oil Index (HOI)	**BEKOlut® H53 glass columns:** Na_2SO_4/Florisil columns acc. to EN ISO 9377–2		Organic solvents
Medium to non–polar, neutral	**BEKOlut® QuEChERS Kits**		Acetonitrile

SPECIALTY PHASE SPE

BEKOlut® NAN
(400 mg Na_2SO_4 / 1400 mg SI–$AgNO_3$ / 400 mg Na_2SO_4)

BEKOlut® CARBON SAC
(acrylamide from water, alternative to BAKERBOND spe Activated Spherical Carbon)

BEKOlut® SCX / SI
for extraction of PCBs

DUAL PHASE–LAYER, e.g. LEOX plus/C18e, the all–round phase for pesticide extraction from water or Carbon / NH_2 for adsorptive clean–up of plant tissue matrices

Many more stationary phase combinations available upon request

BEKOlut®
SPE

PHASE SELECTION ACCORDING TO RETENTION MECHANISM

NORMAL–PHASE SPE

With polar sorbents

BEKOlut® SI

Our silica columns are based on spherical, high purity silica with high specific surface area and optimized particle size, ensuring optimum flow rates and at the same time reproducible recovery.

TYPICAL APPL.: Fractionation of non–polar and polar compounds from lipophilic matrices, e.g. pesticides from foodstuffs, dexamethasone from ointment base, chloramphenicol from muscle homogenate, Multi–method extended DFG S19/ ASU L00.00–34

- **Basis material:** spherical silica
- **Pore size:** 55 Angstrom
- **Particle size:** 40–63 µm
- **Funct. Groups:** non–modified, pure silica
- **Phase mechanism:** strongly polar

BEKOlut® ALOX A/N/B

Our high purity Alox SPE columns are available as acidic, neutral or basic variants of aluminium oxide. The particle size distribution is in the range of 0,063–0,200 mm, the specific surface area is approx. 140 m^2/g.

BEKOlut® Alox A 90, acidic – pH 3.5 – 4.5
BEKOlut® Alox N 90, neutral – pH 6.8 – 7.8
BEKOlut® Alox B 90, basic – pH 8.5 – 10.5

TYPICAL APPL.: Removal of interfering polar compounds with the adsorptive clean–up of organic extracts

Phase mechanism: strongly polar

BEKOlut®
SI
ALOX A/N/B
FLORISIL®

BEKOlut® FLORISIL®

BEKOlut® Florisil® cartridges contain synthetic, high purity magnesium silicate ($MgO:SiO_2$, 15:85), e.g. for an adsorptive clean–up of pesticides from soil and foodstuffs

TYPICAL APPL.: Clean–up of sample extracts containing the following analyte groups: Phthalate esters, chlorinated hydrocarbons, nitrosamines, organochlorine pesticides, nitroaromatics, organophosphates, haloethers, organophosphorous pesticides, aniline and aniline derivatives, PCBs

+– Phase mechanism: strongly polar

Order information			Order number				
Sorbent weight	**Volume**	**Unit / Pck.**	**SI**	**Florisil®**	**Alox A**	**Alox N**	**Alox B**
100 mg	1 mL	100	B01–400–A010	on request	on request	on request	on request
200 mg	3 mL	50	B03–400–A020	on request	on request	on request	on request
500 mg	3 mL	50	B03–400–A050	B03–500–A050	B03–ALA–A050	B03–ALN–A050	B03–ALB–A050
500 mg	6 mL	30	B06–400–A050	B06–500–A050	B06–ALA–A050	B06–ALN–A050	B06–ALB–A050
1 g	6 mL	30	B06–400–A100	B06–500–A100	B06–ALA–A100	B06–ALN–A100	B06–ALB–A100
2 g	15 mL	20	B15–400–A200	B15–500–A200	B15–ALA–A200	B15–ALN–A200	B15–ALB–A200

Florisil®, a registered trade name of U. S. Silica Co. Other formats available on request.

NORMAL–PHASE SPE

With medium polar sorbents

BEKOlut® AMINO (NH_2)

The amino phase offers a different selectivity in normal phase SPE and is a good alternative to silica and cyano phase. It generally retains acids stronger than bases.

TYPICAL APPL.: Lipids from serum, ethinylestradiol from urine (after extraction with organic solvent)

- **Basis material:** silica
- **Pore size:** 60 Angstrom
- **Particle size:** 40–63 µm
- **Funct. Groups:** Aminopropyl
- **Carbon content:** > 6%
- **Phase mechanism:** polar

BEKOlut® PSA

is similar to aminopropyl (NH_2) SPE phases regarding the selectivity, but offers a much higher ion capacity due to the presence of the secondary amine group. Besides the behaviour as polar SPE phase, PSA acts as an weakly anion exchanger and therefore removes fatty acids and organic acids when performing multi–residue pestcide analysis in foodstuffs. It is used in all dispersive QuEChERS kits for sample clean–up.

- **Basis material:** silica
- **Pore size:** 60 Angstrom
- **Particle size:** 40–63 µm
- **Funct. Groups:** Ethylenediamine–N–propyl
- **Carbon content:** > 6 %
- **Nitrogen content:** > 2 %
- **Phase mechanism:** polar and weakly basic anion exchange
- **Sample Matrix Compatibility:** organic or aqueous solutions

BEKOlut®
AMINO (NH_2)
CYANO (CN)
PSA

BEKOlut® CYANO (CN)

For polar analytes that give too high retention on BEKOlut® SI, changing to BEKOlut® Cyano might be an option. BEKOlut® CN phase closes the selectivity gap within the other normal phase sorbents of the BEKOlut® range, silica and amino.

TYPICAL APPL.: Stilbenes from water (after extraction with organic solvent)
It could be used for retention of polar compounds from n–hexane and oils and is suited for reversed phase extraction of moderately polar compounds.

- **Basis material:** silica
- Å **Pore size:** 100 Angstrom
- µ **Particle size:** 40–63 µm
- **Funct. Groups:** Cyanopropyl
- EC **Endcapping:** no
- C **Carbon content:** > 6%
- +– **Phase mechanism:** polar

Order information			Order number		
Sorbent weight	**Volume**	**Unit / Pck.**	**Amino (NH_2)**	**PSA**	**Cyano (CN)**
100 mg	1 mL	100	B01–800–A010	B01–PSA–A010	B01–900–A010
200 mg	3 mL	50	B03–800–A020	B03–PSA–A020	B03–900–A020
500 mg	3 mL	50	B03–800–A050	B03–PSA–A050	B03–900–A050
500 mg	6 mL	30	B06–800–A050	B06–PSA–A050	B06–900–A050
1 g	6 mL	30	B06–800–A100	B06–PSA–A100	B06–900–A100
2 g	15 mL	20	B15–800–A200	B15–PSA–A200	B15–900–A200

Other formats available on request.

REVERSED–PHASE SPE

With silica based sorbents

BEKOlut® C8

BEKOlut® C8 is a trifunctional chemically modified reversed phase with high ligand density and hence, high capacity.

TYPICAL APPL.: Polar and medium polar analytes from aqueous samples, if retention on C18 is too high and too much eluent would be required, e.g. steroids from serum.

- **Basis material:** silica
- Å **Pore size:** 100 Angstrom
- µ **Particle size:** 40–63 µm
- **Funct. Groups:** C8
- EC **Endcapping:** no
- C **Carbon content:** > 9%
- +– **Phase mechanism:** non–polar, reversed phase

BEKOlut® C18

BEKOlut® C18 is a non–endcapped reversed phase. Its silica surface has free silanol groups that can effect secondary interactions with basic compounds.

TYPICAL APPL.: Polar and medium polar analytes from aqueous sample solutions, e.g. pesticides from water, neutral drugs from biological matrices.

- **Basis material:** silica
- Å **Pore size:** 100 Angstrom
- µ **Particle size:** 40–63 µm
- **Funct. Groups:** C18
- EC **Endcapping:** no
- C **Carbon content:** > 14%
- +– **Phase mechanism:** non–polar, reversed phase

BEKOlut®
C8
C18
C18e

BEKOlut® C18e

BEKOlut® C18e is a reversed phase with endcapping, based on silica with suitable specific surface area and 60 Angstrom pore size.

TYPICAL APPL.: non–polar compounds from aqueous solution, e.g. parabenes from cosmetics, 16 EPA PAHs from water.

- **Basis material:** silica
- **Pore size:** 60 Angstrom
- **Particle size:** 40–63 µm
- **Funct. Groups:** C18
- **Endcapping:** yes
- **Carbon content:** > 16%
- **Phase mechanism:** non–polar, reversed phase

Order information			Order number		
Sorbent weight	**Volume**	**Unit / Pck.**	**C8**	**C18**	**C18e**
100 mg	1 mL	100	B01–200–A010	B01–100–A010	B01–101–A010
200 mg	3 mL	50	B03–200–A020	B03–100–A020	B03–101–A020
500 mg	3 mL	50	B03–200–A050	B03–100–A050	B03–101–A050
500 mg	6 mL	30	B06–200–A050	B06–100–A050	B06–101–A050
1 g	6 mL	30	B06–200–A100	B06–100–A100	B06–101–A100
2 g	15 mL	20	B15–200–A200	B15–100–A200	B15–101–A200

Other formats available on request.

REVERSED–PHASE SPE

With polymeric High Performance sorbents – Part 1

BEKOlut® LEOX®

BEKOlut® Leox® is a polymeric sorbent similar to HPLC sorbents, providing nearly ideal characteristics with regard to retention and elution of polar and non–polar analytes from biological and aqueous matrices.

TYPICAL APPL.: Non–polar and polar compounds from aqueous solutions, e.g. pesticides from water, polar drugs from biological samples (sulfonamides, tetracycline and quinolone residues from meat, Vitamin K from serum)

- **Basis material:** PS–DVB copolymer
- **Specific surface area:** ca. 620 m^2/g
- **Pore volume:** 0.9 mL/g
- **Pore size:** 100 Angstrom
- **Particle size:** 40–63 µm
- **pH stability:** 1–14
- **Phase mechanism:** non–polar, reversed phase

- **BEKOlut® Leox®:** symmetrical elution profiles for polar as well as lipophilic analytes
- **High analyte recovery, neutral RP retention mechanism**
- **No swelling in organic solvents**

BEKOlut®
LEOX®
LEOX® PLUS

BEKOlut® LEOX® PLUS

BEKOlut® Leox® plus is a highly crosslinked, macroporous PS–DVB copolymer with almost perfect spherical beads and an exceptionally high specific surface area. The all–in–one SPE cartridge for all kind of pesticides in water.
TYPICAL APPL.: Mainly extraction of polar compounds from aqueous solutions, e.g. pesticides, phenols, sweeteners, pharmaceutical ingredients.

- **Basis material:** PS–DVB copolymer
- **Specific surface area:** > 1500 m^2/g
- **Pore size:** 30 Angstrom
- **Particle size:** 60–70 µm
- **pH stability:** 1–14
- **Phase mechanism:** non–polar, reversed phase

Order information			Order number	
Sorbent weight	Volume	Unit / Pck.	Leox®	Leox® plus
30 mg	1 mL	100	B01–P01–A003 for HPLC–determination of vitamin K in serum	B01–P06–A003
60 mg	1 mL	100	B01–P01–A006	B01–P06–A006
60 mg	3 mL	50	B03–P01–A006	B03–P06–A006
200 mg	3 mL	50	B03–P01–A020	B03–P06–A020
500 mg	3 mL	50	B03–P01–A050	B03–P06–A050
500 mg	6 mL	30	B06–P01–A050	B06–P06–A050
1 g	6 mL	30	B06–P01–A100	B06–P06–A100
2 g	15 mL	20	B15–P01 –A200	B15–P06–A200

Other formats available on request.

REVERSED–PHASE SPE

With polymeric High Performance sorbents – Part 2

BEKOlut® HLB

Due to its ambivalent hydrophilic–lipophilic character, BEKOlut® HLB is an all–purpose phase material for a multitude of polar and non–polar compounds. In comparison with silica based C18, BEKOlut® HLB exhibits a 2–3 times higher specific surface area and thus a higher analyte capacity.

TYPICAL APPL.: Extraction of polar and non–polar substances from aqueous solutions.

- **Basis material:** PS–DVB copolymer
- **Specific surface area:** ca. 600 m^2/g
- **Pore size:** 70 Angstrom
- **Particle size:** 38–55 µm
- **pH stability:** 1–14
- **Phase mechanism:** non–polar, reversed phase

BEKOlut® HLB^{XTRA}

The functionalisation of this copolymer effects also a very pronounced hydrophilic–lipophilic balance for many types of analytes. Additionally, it provides electron pair donator and hydrogen donator/acceptor characteristics that facilitate enrichment of acidic, basic and neutral compounds without adjusting sample pH. Moreover, HLB^{Xtra} provides marked selectivity for polar compounds.

TYPICAL APPL.: Extraction of neutral, polar and non–polar substances from aqueous solutions

- **Basis material:** PS–DVB copolymer
- **Specific surface area:** ca. 600 m^2/g
- **Pore size:** 70 Angstrom
- **Particle size:** 38–55 µm
- **pH stability:** 1–14
- **Phase mechanism:** non–polar, reversed phase

Analyte	BEKOlut® HLB	BEKOlut® HLB^{Xtra}	Competitor
Comparison of the [%] recoveries for neutral, basic and acidic analytes after SPE			
Caffeine	98.6	100.4	100.1
Metoprolol	80.1	88.2	91.2
Salicylic acid	21.4	109.7	8,0

BEKOlut®
HLB
HLB^{XTRA}

	Neutral and basic compounds (e.g. Metoprolol)	**Acidic compounds** (e.g. Salicylic acid)
Recommended generic method (BEKOlut® HLB^{Xtra}, 60 mg/3 mL)		
Conditioning	2 x 2 mL methanol 2 x 2 mL water	2 x 2 mL methanol 2 x 2 mL water
Sample loading	1 mL aqueous sample	1 mL aqueous sample
Washing	2 mL water (max. 5 % organics) 4 min drying	2 mL mL water (max. 5 % organics) 4 min drying
Elution	2 x 2 mL methanol	2 x 2 mL methanol (possibly addition of acetic/ formic acid)

Order information			**Order number**	
Sorbent weight	**Volume**	**Unit / Pck.**	**HLB**	**HLB^{Xtra}**
30 mg	1 mL	100	B01-HLB-A003	B01-XTR-A003
60 mg	1 mL	100	B01-HLB-A006	B01-XTR-A006
60 mg	3 mL	50	B03-HLB-A006	B03-XTR-A006
200 mg	3 mL	50	B03-HLB-A020	B03-XTR-A020
500 mg	3 mL	50	B03-HLB-A050	B03-XTR-A050
500 mg	6 mL	30	B06-HLB-A050	B06-XTR-A050
1 g	6 mL	30	B06-HLB-A100	B06-XTR-A100
2 g	15 mL	20	B15-HLB-A200	B15-XTR-A200

Other formats available on request.

ION EXCHANGE SPE

Silica based – Part 1

BEKOlut® SAX

Is a strongly basic anion exchanger based on silica.

TYPICAL APPL.: Weakly acidic compounds from aqueous samples and biomatrices.

- **Basis material:** silica
- **Pore size:** 60 Angstrom
- **Particle size:** 40–63 µm
- **Funct. Groups:** anion exchange, reversed phase
- **Phase mechanism:** anion exchange, reversed phase

BEKOlut® SCX

Is a strongly acidic cation exchanger based on silica.

TYPICAL APPL.: Weakly basic compounds from aqueous samples and biomatrices.

- **Basis material:** silica
- **Pore size:** 60 Angstrom
- **Particle size:** 40–63 µm
- **Funct. Groups:** Sulfonyl group
- **Phase mechanism:** cation exchange, reversed phase

BEKOlut®
SAX
SCX
MULTIMODE

BEKOlut® MULTIMODE

Is a mixed–mode sorbent which combines non–polar, strong cation exchange and strong anion exchange retention mechanisms. Interferences (acidic, basic and non–polar) from the sample are retained on the SPE column, while the target analyte (often polar and neutral) is passing through the column and being collected.
This method is applied for the clean–up of **acrylamide from foodstuffs**.

Order information			Order number		
Sorbent weight	**Volume**	**Unit / Pck.**	**SAX**	**SCX**	**Multimode**
100 mg	1 mL	100	B01–SAX–A010	B01–SCX–A010	B01–MM0–A010
200 mg	3 mL	50	B03–SAX–A020	B03–SCX–A020	B03–MM0–A020
500 mg	3 mL	50	B03–SAX–A050	B03–SCX–A050	B03–MM0–A050
500 mg	6 mL	30	B06–SAX–A050	B06–SCX–A050	B06–MM0–A050
1 g	6 mL	30	B06–SAX–A100	B06–SCX–A100	B06–MM0–A100
2 g	15 mL	20	B15–SAX–A200	B15–SCX–A200	B15–MM0–A200

Other formats available on request.

ION EXCHANGE SPE

Polymer based – Part 2

BEKOlut® LEOX® CX

(RP/strongly acidic cation exchange)

Is a mixed–mode, strongly acidic cation exchange resin, providing a dual retention mechanism and suitable for selective SPE of weakly basic drugs. Also, a step–wise elution is possible for the clean–up of biological samples in toxiclogical analyses. Neutral elution with methanol primarily elutes neutral compounds and only in the second step, weakly basic compounds will elute after addition of 2–5 % ammonia to the organic elution solvent.

TYPICAL APPL.: Weakly basic pharmaceutical compounds from aqueous samples and biomatrices.

- **Basis material:** PS–DVB copolymer
- **Specific surface area:** ca. 600 m^2/g
- **Pore size:** 70 Angstrom
- **Particle size:** 38–55 µm
- **pH stability:** 1–14
- **Phase mechanism:** cation exchange, reversed phase

BEKOlut® LEOX® WCX

(RP/weakly acidic cation exchange)

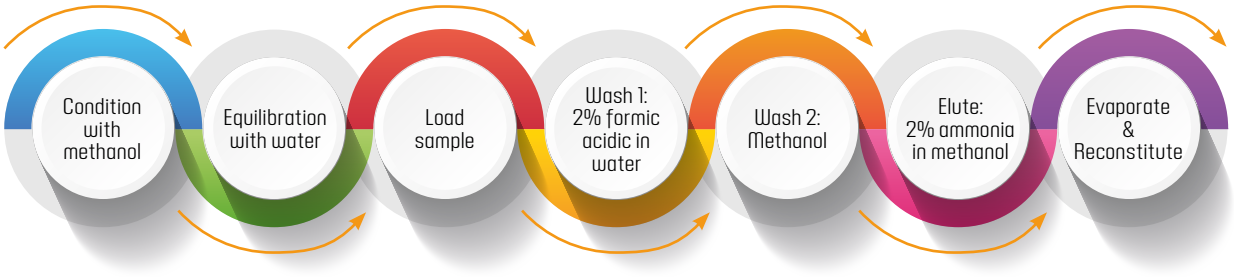
Is a SPE phase with dual retention mechanism – weakly acidic cation exchange combined with a polymer based reversed phase mechanism for retaining strongly basic compounds.

TYPICAL APPL.: Extraction of strongly basic cations from aqueous solutions and biomatrices.

- **Basis material:** PS–DVB copolymer
- **Specific surface area:** ca. 600 m^2/g
- **Pore size:** 70 Angstrom
- **Particle size:** 38–55 µm
- **pH stability:** 1–14
- **Phase mechanism:** cation exchange, reversed phase

BEKOlut®
LEOX CX
LEOX WCX

RECOMMENDED GENERIC METHOD
for Leox® CX



Order information			Order number	
Sorbent weight	**Volume**	**Unit / Pck.**	**Leox® CX**	**Leox® WCX**
30 mg	1 mL	100	B01-PCX-A003	B01-WCX-A003
60 mg	1 mL	100	B01-PCX-A006	B01-WCX-A006
60 mg	3 mL	50	B03-PCX-A006	B03-WCX-A006
200 mg	3 mL	50	B03-PCX-A020	B03-WCX-A020
500 mg	3 mL	50	B03-PCX-A050	B03-WCX-A050
500 mg	6 mL	30	B06-PCX-A050	B06-WCX-A050
1 g	6 mL	30	B06-PCX-A100	B06-WCX-A100
2 g	15 mL	20	B15-PCX-A200	B15-WCX-A200

Other formats available on request.

ION EXCHANGE SPE

Polymer based – Part 2

BEKOlut® LEOX® AX

(RP/strongly basic anion exchange)

This strong anion exchange resin has been developed to improve the performance of conventional silica based mixed–mode anion exchangers for the SPE of weakly acidic analytes.

TYPICAL APPL.: Extraction of weakly acidic pharmaceutical compounds from aqueous samples and biomatrices.

- **Basis material:** PS–DVB copolymer
- **Specific surface area:** ca. 600 m^2/g
- **Pore size:** 70 Angstrom
- **Particle size:** 38–55 µm
- **pH stability:** 1–14
- **Phase mechanism:** anion exchange, reversed phase

BEKOlut® LEOX® WAX

(RP/weakly basic anion exchange)

This weak anion exchanger facilitates a dual retention mechanism based on a weakly basic anion exchange for strongly acids and a neutral RP mechanism.

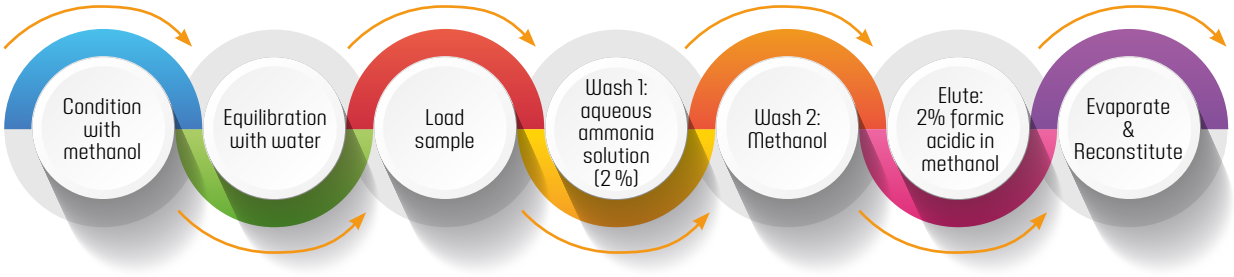
TYPICAL APPL.: Extraction of strongly acidic analytes from aqueous samples and biomatrices.

- **Basis material:** PS–DVB copolymer
- **Specific surface area:** ca. 600 m^2/g
- **Pore size:** 70 Angstrom
- **Particle size:** 38–55 µm
- **pH stability:** 1–14
- **Phase mechanism:** anion exchange, reversed phase

Mixed–mode anion exchange SPE methods are suitable for extraction and clean–up of 11–nor–9–carboxy–Δ9–tetra–hydrocannabinol (THC–COOH), from urine samples. THC–COOH is the major metabolite of the main psychoactive compound of marijuana, 9–tetrahydrocannabinol.

BEKOlut®
LEOX AX
LEOX WAX

RECOMMENDED GENERIC METHOD
for Leox® AX



Order information			Order number	
Sorbent weight	**Volume**	**Unit / Pck.**	**Leox® AX**	**Leox® WAX**
30 mg	1 mL	100	B01-PAX-A003	B01-WAX-A003
60 mg	1 mL	100	B01-PAX-A006	B01-WAX-A006
60 mg	3 mL	50	B03-PAX-A006	B03-WAX-A006
200 mg	3 mL	50	B03-PAX-A020	B03-WAX-A020
500 mg	3 mL	50	B03-PAX-A050	B03-WAX-A050
500 mg	6 mL	30	B06-PAX-A050	B06-WAX-A050
1 g	6 mL	30	B06-PAX-A100	B06-WAX-A100
2 g	15 mL	20	B15-PAX-A200	B15-WAX-A200

Other formats available on request.

PHASE SELECTION BY APPLICATION AREA

APPLICATION–SPECIFIC SPE–PHASES

BEKOlut®
APPLICATION–SPEFICIC SPE

Innovative solutions for your specific applications

Application–specific phases are our specialty – we offer tailor–made products for applications in environmental, pharmaceutical and foodstuff analysis as well as for automated Gilson and GERSTEL systems. In case you would need a very special phase, why don't you take advantage of our decades of experience in developing and manufacturing SPE products and solve your analytical problem with BEKOlut®?

APPLICATION–SPECIFIC SPE–PHASES

SPE IN ENVIRONMENTAL ANALYSIS

BEKOlut® NAN

NAN is a combined phase of sodium sulfate and silica/ silver nitrate for removal of traces of water, sulfur, sulfur containing and polar compounds

TYPICAL APPL.: Clean–up of PCBs from effluent sludge.

+– **Phase mechanism:** polar, normal phase

BEKOlut® H53

ready–to–use – Glass columns

TYPICAL APPL.: Determination of the mineral oils (Hydrocarbon Oil Index, HOI) according to DIN EN ISO 9377–2/H53

+– **Phase mechanism:** polar, normal phase

BEKOlut® GLYPHOSATE/AMPA COLUMNS

acc. to DIN 38407–22 (BEKOlut® IXC 508/IXC 108, combination of two columns).

+– **Phase mechanism:** ion exchange

BEKOlut® SCX / SI

Is a combined phase based on silica and a silica based strongly acidic cation exchanger.

TYPICAL APPL.: Clean–up of PCBs from organic extracts

+– **Phase mechanism:** polar, ion exchange

BEKOlut® CARBON GCB

Carbon GCB provides a marked affinity to planar mole–cules and can be used for example to remove chlorophyll, carotinoids and sterols from foodstuff and plant tissue samples.

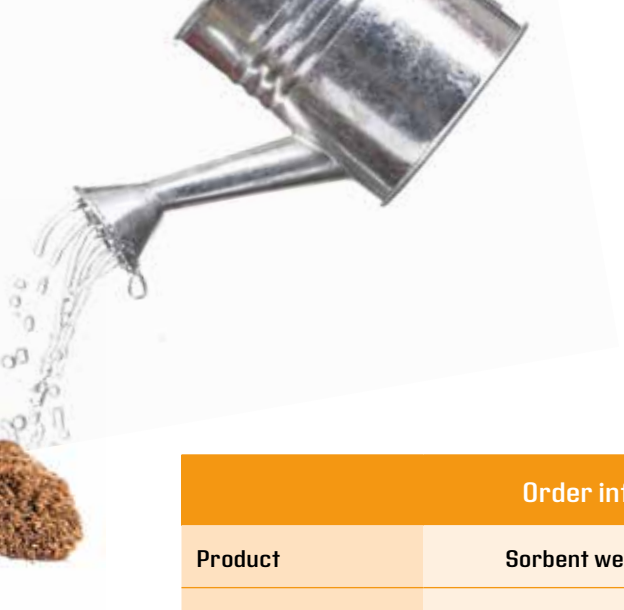
TYPICAL APPL.: reversed phase, π–π interactions

+– **Phase mechanism:** polar, ion exchange

BEKOlut® CARBON SAC
(spherical activated carbon)

for the SPE of acrylamide from water.

+– **Phase mechanism:** retaining very polar, hydrophilic molecules, which are normally not retained under reversed phase conditions



BEKOlut®
APPLICATION-SPEFICIC SPE

Order information				Order number
Product	**Sorbent weight**	**Volume**	**Unit / Pck.**	
BEKOlut® NAN	400/1400/400 mg	3 mL	50	B03-444-A140
	700/2000/700 mg	6 mL	30	B06-444-A200
BEKOlut® SCX/SI	500/500 mg	3 mL	50	B03-439-A050
	500/500 mg	6 mL	30	B06-439-A050
BEKOlut® H53 Florisil®/Na_2SO_4	1000/1000 mg	15 mL	50	KP1-015-A11G
	2000/2000 mg	15 mL	50	KP1-015-A22G
	4000/2000mg	15 mL	50	KP1-015-A42G
BEKOlut® Carbon GCB	200 mg	3 mL	50	B03-GCB-A020
	500 mg	6 mL	30	B06-GCB-A050
BEKOlut® Glyphosate/AMPA	IXC 108 (strongly basic anion exchanger)	3 mL	50	B03-108-A050
	IXC 508 (strongly acidic cation exchanger)	3 mL	50	B03-508-A050
BEKOlut® Carbon SAC	500 mg	6 mL	30	B06-AC2-A050
	1000 mg	6 mL	30	B06-AC2-A100

Other formats available on request.

APPLICATION–SPECIFIC SPE–PHASES

SPE IN FOODSTUFF ANALYSIS

IMMUNAFFINITY COLUMNS: A SIMPLE AND RELIABLE CLEAN–UP AND ENRICHMENT FOR MYCOTOXINS

Our Clean–up columns for regulated mycotoxins are based on a specific antibody–analyte binding mecha–nism. Highly specific, monoclonal antibodies coupled to highly permeable gel particles capture the mycotoxins to be analyzed and release them after a washing step.

Advantages of IAC:
Proven quality, excellent flow behaviour, robustness, high permeability of the gel, working without extra pressure, detection of **multi–mycotoxins** in various types of commodities.

Order information			Order number
Product	**Volume**	**Unit / Pck.**	
BEKOlut® Combi–IAC Afla/Ochra/ZON	3 mL	25	003–AOZ
BEKOlut® Combi–IAC Afla/Ochra/ZON/DON/FUM/T2HT2	3 mL	25	003–AOZDFT
BEKOlut® IAC Aflatoxin M1	3 mL	25	003–AFL–M1
BEKOlut® IAC Aflatoxin	3 mL	25	003–AFL
BEKOlut® IAC DON	3 mL	25	003–DON
BEKOlut® IAC Fumonisin	3 mL	25	003–FUM
BEKOlut® IAC Ochratoxin	3 mL	25	003–OTA
BEKOlut® Zearalenon	3 mL	25	003–ZEA

Other formats available on request.

BEKOlut®
SPE
MYCOTOXIN
QuEChERS

BEKOlut® CLEAN–UP CARTRIDGE
for Mycotoxins

Is a SPE cartridge for cleaning–up **multi–mycotoxins** from a variety of foodstuff matrices.

Order information			Order number
Product	**Volume**	**Unit / Pck.**	
BEKOlut® Clean–up Cartridge for Mycotoxins	6 mL	30	B06–QUE–MYC

BEKOlut® MYCOTOXIN

is a specially–treated sorbent for fast and efficient clean–up of food extracts, mainly from cereals and baked goods for **trichothecene** and **zearalenon** ana–lysis. BEKOlut® Mycotoxin is also availale as **MPS** column.

Order information				Order number
Product	**Sorbent weight**	**Volume**	**Unit / Pck.**	
BEKOlut® Mycotoxin	500 mg	3 mL	50	B03–MYC–A050

QuEChERS FOR FOODSTUFFS ANALYSIS

For **QuEChERS methods** we offer highest quality extraction and clean–up kits at unrivalled low prices in order to facilitate your daily lab work. Please ask for our QuEChERS flyer for further information.

AUTOMATED SPE

AUTOMATED SOLID–PHASE EXTRACTION

Performing solid–phase extraction manually can be time consuming and nerve–racking, especially when recovery and reproducibility are lacking due to sample variability. If SPE can be reliably automated, it becomes a much more efficient and reproducible process.

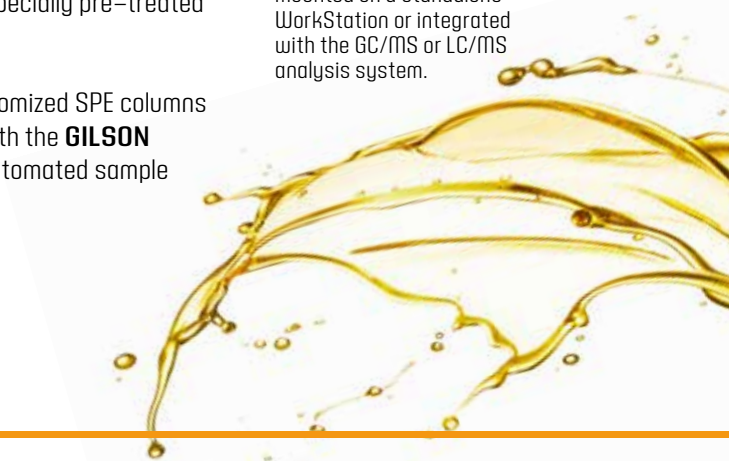
We offer different configurations for the automated SPE:

1. BEKOlut® cartridges for the **online SPE** with standard dimensions 20 x 4 mm filled with BEKOlut® sorbents, like e.g. Leox® Plus for pesticide residue analysis from water.

2. The MPS with automated SPE option provides several advantages compared with manual SPE. These are e.g. improved recovery, higher precision and reproducibility and maximized sample throughput by performing SPE during GC or LC analysis. This results in more than 50 % time saving for the overall analysis, compared to manual processing. **BEKOlut® MPS columns** are already equipped with appropriate transport adapters and needles for the GERSTEL MultiPurposeSampler (MPS) and filled with the focus on column volume of choice. The columns are manufactured focusing on highest purity of the resulting extracts. Please contact us for lot reservations or specially pre–treated sorbents.

3. All SPE columns from our standard product range as well as customized SPE columns are available with pre–assembled appropriate caps to be used with the **GILSON ASPEC™ Automatic solid–phase extraction Systems** for automated sample preparation. Please contact us for further details.

The GERSTEL SPE2 can be mounted on a standalone WorkStation or integrated with the GC/MS or LC/MS analysis system.



BEKOlut®
AUTOMATED SPE

TYPICAL APPLICATIONS WITH THE MPS ARE:

- **Clean–up** with BEKOlut® LB10 columns for **inference–free analysis** of residual PAHs in edible oils
- BEKOlut® Mycotoxin for **mycotoxin analysis in cereals** and **corn**

Order information				Order number
Product for GERSTEL MPS	**Sorbent weight**	**Volume**	**Unit / Pck.**	
BEKOlut® C18e	100 mg	1 mL	100	B01–101–A010_MPS
	100 mg	3 mL	50	B03–101–A010_MPS
	500 mg	3 mL	50	B03–101–A050_MPS
	500 mg	6 mL	30	B06–101–A050_MPS
	1000 mg	6 mL	30	B06–101–A100_MPS
BEKOlut® LB 10	60 mg	1 mL	100	B01–P05–A006_MPS
	500 mg	6 mL	30	B06–P05–A050_MPS
BEKOlut® SI	100 mg	3 mL	50	B03–400–A010_MPS
	500 mg	3 mL	50	B03–400–A050_MPS
	1000 mg	6 mL	30	B06–400–A100_MPS
BEKOlut® Mycotoxin	500 mg	3 mL	50	B03–MYC–A050_MPS

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Information

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bekolut

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