

*Immunoaffinity Columns  
Automated Sample Preparation  
ELISA Rapid Tests  
Photochemical Derivatization  
Post-column Derivatization with PICKERING  
Vacuum Manifold  
Selected HPLC Column  
Support*



# Mycotoxins

## Sample Preparation and Analysis

Cultivation and storage of food and animal feed may contribute to the spread of moulds, which produce mycotoxins - toxic secondary metabolites. Their consumption can lead to serious health damage in both humans and animals.

**LC**Tech** supports you with a wide range of reliable products at competitive prices. In addition you can rely on outstanding customer support.**

# About LCTech



LCTech GmbH is based in Dorfen, Germany. Since 1998, we have been developing and supplying products and methods for the preparation and analysis of food, animal feed and environmental samples.

Our product range includes both semi and fully automated sample preparation systems as well as consumables utilised in the analysis of contaminants and residues.

LCTech is represented worldwide through a well-developed distributor network and also acts as the exclusive distributor for PICKERING Laboratories in Europe, Africa and the Arab countries.

Worldwide, many customers – including governmental and contract laboratories focusing on food and feed analysis, and also those based in the pharmaceutical industry or research - are equally appreciative of both our modern and efficient products and the responsive and competent customer support.



**„Customer satisfaction  
is our top priority“**

A handwritten signature in blue ink that reads "L. Baumann".

Michael Baumann,  
Managing Director



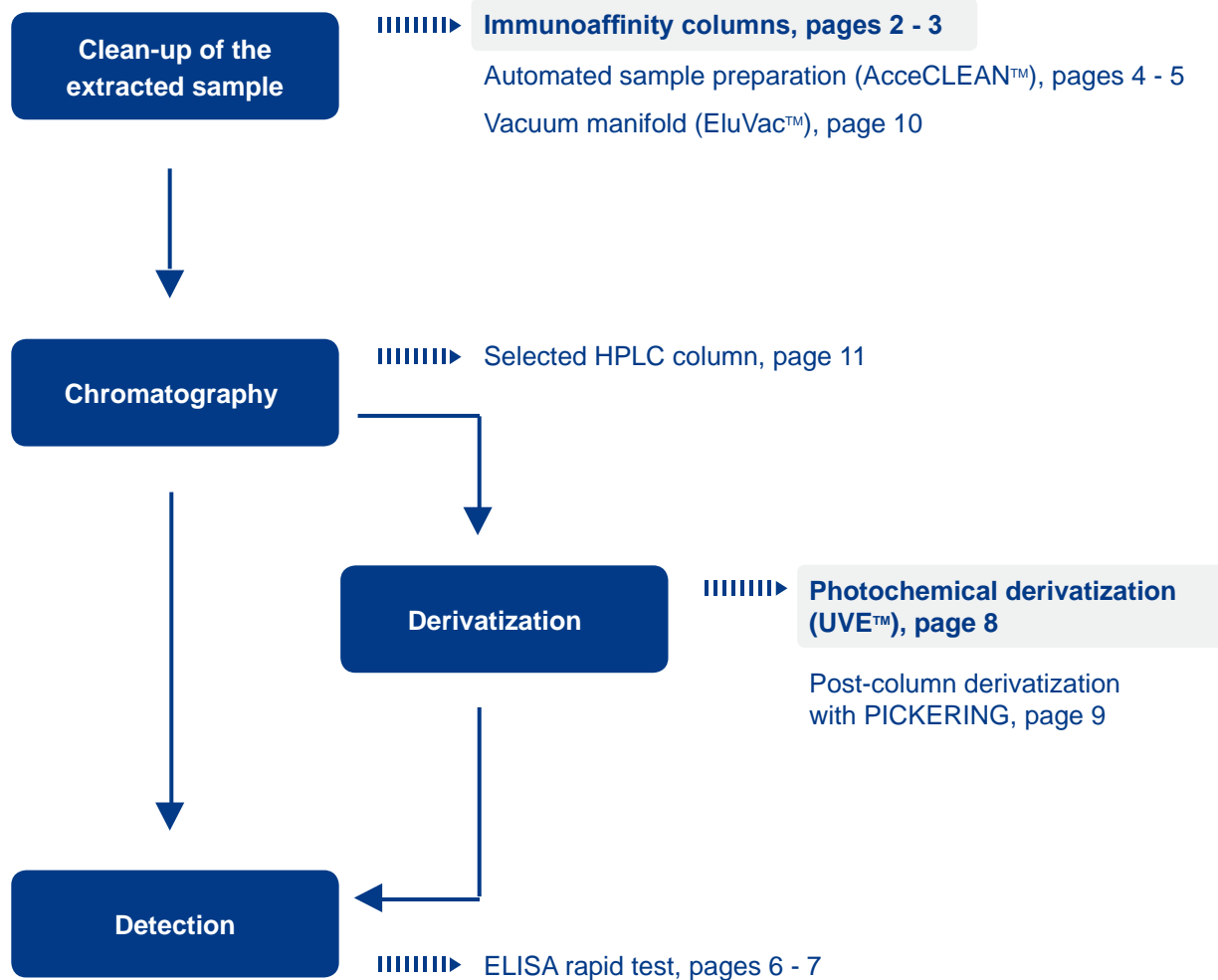
**Visit us on [www.LCTech.de](http://www.LCTech.de)**

*Get further and permanently updated  
product information on our website.*

# Mycotoxins

## Sample Preparation and Analysis

### Precise, Simple and Fast with LCTech Products



Immunoaffinity columns, pages 2 - 3

Selected references relating to our products, page 13

# Immunoaffinity Columns

## Fast and Efficient Sample Clean-Up



### Proven and tested

The LCTech immunoaffinity columns are suitable for the clean-up of food and feed samples ready for subsequent analysis.

With high maximum loading capacities the measuring range is wide.

The antibodies show a high specificity against the respective mycotoxin. The chromatographic results are excellent without interfering signals and achieve very high recovery rates – even in the most difficult samples.

The immunoaffinity columns are successfully employed for the most diverse matrices in accredited laboratories worldwide. These columns performed well in international interlaboratory trials.

### Advantages at a glance

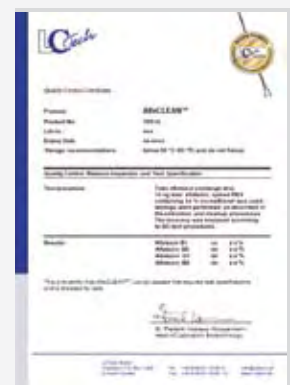
- ✓ High loading capacities
- ✓ Guaranteed high recovery rates
- ✓ Long storage life up to 24 months
- ✓ Storage at room temperature
- ✓ Advantageous 3 mL column format available: Larger diameter results in increased tolerance for matrix contaminations
- ✓ Detailed protocols for processing a large variety of samples are available
- ✓ Competent, free of charge application support
- ✓ Packs of 25 pieces or of bulk packs with 500 pieces available
- ✓ For large sample volumes corresponding reservoirs are available



### Certified quality

LCTech meets the high demands of European and international legal requirements concerning mycotoxin analysis and controls every single production step.

A detailed quality certificate is included in each pack.



### One of our customers writes:



Food and Environment Research Agency (FERA)  
Department of Natural Toxins  
United Kingdom

*"LCTech immunoaffinity columns offer high quality sample clean up combined with great value.*

*The UK Food and Environmental Agency, (FERA, formerly CSL) evaluated the columns throughout 2008 and received strong technical support from LCTech during the process, allowing us to tailor standard protocols to our methods easily and quickly.*

*The products have enabled us to offer a far more cost effective service to our customers."*

## LCTech immunoaffinity columns at a glance

Immunoaffinity column Mycotoxin	Size, Pcs (Product N°)	Recoveries	Shelf life and temperature	Loading capacity, ng/column
<b>AflaCLEAN Select</b> Aflatoxins B1, B2, G1, G2	1 mL, 25 pcs (12062)	B1 > 90	9 months cooled at 4 °C	200 (aflatoxin B1)
	1 mL, 100 pcs (12323)	B2 > 80		
	1 mL, 500 pcs (12063)	G1 > 90		
	3 mL, 25 pcs (12058)	G2 > 60		
	3 mL, 500 pcs (12059)			
<b>OtaCLEAN™</b> Ochratoxin A	1 mL, 25 pcs (12425)	> 90 %	24 months room temperature	200
	1 mL, 100 pcs (12426)			
	1 mL, 500 pcs (12427)			
	3 mL, 25 pcs (10515)			
	3 mL, 500 pcs (11535)			
<b>Afla-OtaCLEAN™</b> Aflatoxins B1, B2, G1, G2 and ochratoxin A	3 mL, 25 pcs (11022)	> 90 % (aflatoxin B1)	12 months room temperature	150 (aflatoxin B1)
	3 mL, 500 pcs (11771)	> 80 % (ochratoxin A)		200 (ochratoxin A)
<p><b>Combination column - fast clean-up in tandem</b></p> <p>Aflatoxins and ochratoxin A often occur together and are therefore jointly analysed.</p> <p>The combination column Afla-OtaCLEAN™ makes your work much easier by cleaning the extract within one processing step.</p>				
<b>Sample reservoirs</b> for large sample volumes, made of Duran glass, reusable and dishwasher proof		2 pcs / pack (10896)		



**Are you considering switching  
to LCTech columns ... ..**

*... and would like to try them?*

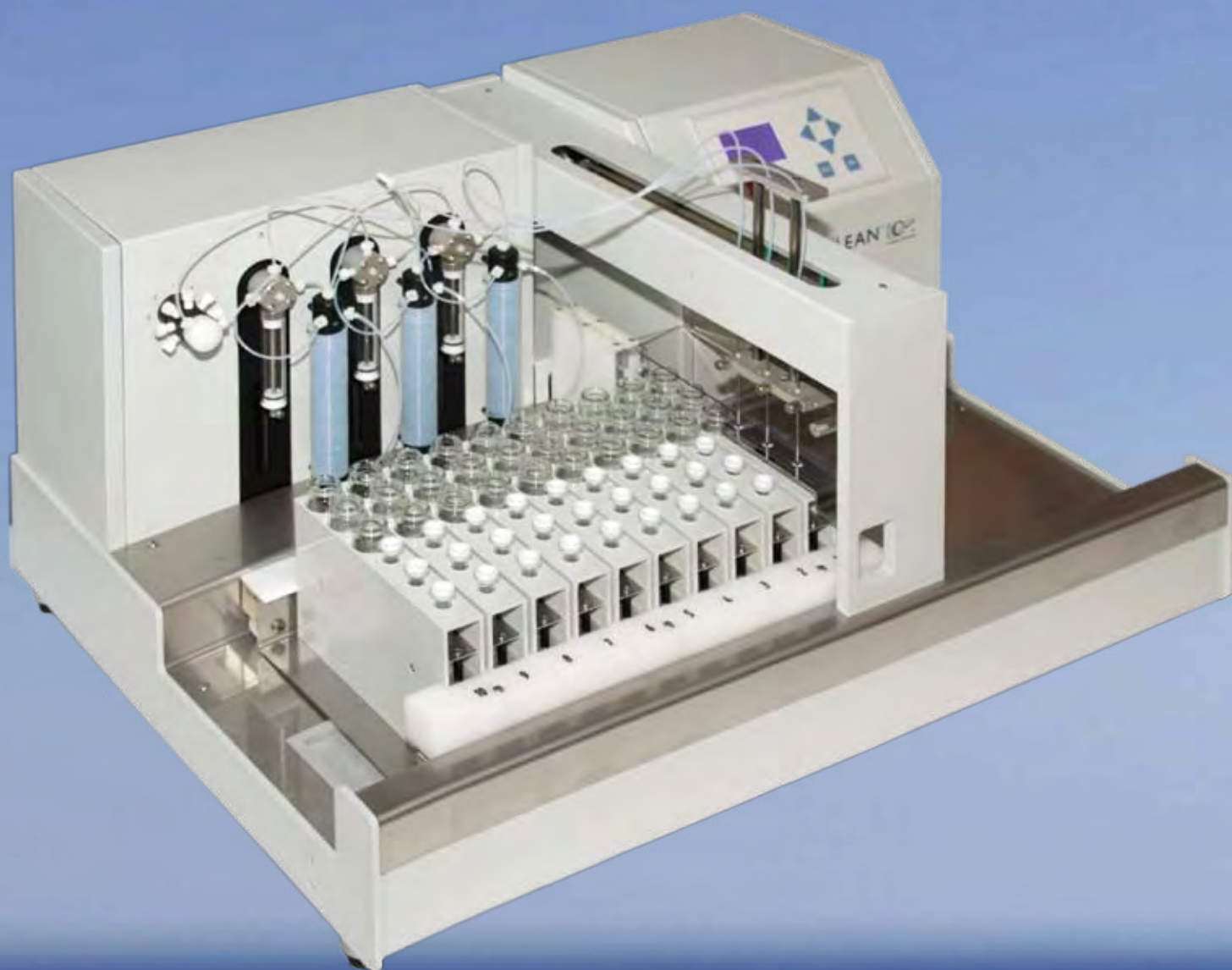
*Please simply ask for our support!*

# AcceCLEAN™

Parallelization - Invaluable Time Saving Process Design



*30 columns  
in one run ...*



# Automated Sample Preparation

... and Three at One Blow



## Fully automated extract clean-up

The LCTech sample preparation system AcceCLEAN™ uses automated raw extract processing with immunoaffinity columns.

Consequently, samples are cleaned up faster and more conveniently and are ready for subsequent analysis.



### Flexibility counts!

The system AcceCLEAN™ is also suitable for various solid phase extractions (SPE).

## Three needles = threefold throughput

AcceCLEAN™ handles up to three samples simultaneously and up to 30 in one run.

This system enables speedy sample preparation at an affordable price. AcceCLEAN™ automates time-consuming procedures.

## Broad range of applications

Over time your applications may change. However, AcceCLEAN™ stays flexible and can be adapted at anytime.

## Advantages at a glance

- ✓ Substantially increased sample throughput
- ✓ Excellent recovery rates
- ✓ Intuitive operation – without PC
- ✓ High quality components for high precision
- ✓ Robust, safe design
- ✓ Pre-set methods for LCTech immunoaffinity columns



The columns remain closed whilst on the system – positive pressure ensures constant flow rates.



Three needles in parallel triple sample throughput.



The racks are easily charged.

### Ordering information

### Product N°

**AcceCLEAN™**  
Automated system for immunoaffinity and SPE columns

11020

*Racks, accessories and installation on request*



Each consignment is checked in-house for its functionality and reproducibility. The result is documented with a quality certificate by LCTech.

# ELISA Rapid Tests

## Simple, Fast and Cost-Efficient Screening for Aflatoxin B1 and Ochratoxin A in Food and Feed

ELISA rapid test Mycotoxin	Measuring range	Processing time	Shelf life and temperature	Product N°
<b>AflaREAD™</b> Aflatoxin B1	2-100 ppb	130 minutes	12 months cooled at 4°C	11139
<b>AflaREAD fast</b> <b>NEW</b> Aflatoxin B1 in peanuts and maize	2-100 ppb	< 45 minutes	12 months cooled at 4°C	11853
<b>OtaREAD™</b> Ochratoxin A	2 - 20 ppb, for beer 0.6 - 6 ppb, for wine 0.8 - 8 ppb	130 minutes	12 months cooled at 4°C	11068
<b>OtaREAD fast</b> <b>NEW</b> Ochratoxin A in peanuts and maize	2 - 20 ppb	< 25 minutes	12 months cooled at 4°C	11854
<b>Photometer</b> with 450 nm filter, also mobile use on-site				11689

### Incredibly simple handling

The rapid tests are ready-to-use: They contain a 96-well ELISA plate; they can also be used individually in 8-well strips. All required reagents and standard solutions are included.

An extensive manual together with a set of descriptive brief instructions lead even inexperienced lab staff safely through the uncomplicated application.

Even for difficult matrices, such as coffee or red wine, a clean-up of the sample extract is not necessary (e.g. with SPE or IAC).

### Advantages at a glance

- ✓ Complete, low-cost rapid tests
- ✓ The same extract may be used for all rapid tests
- ✓ Only two extraction methods for solid samples
- ✓ Best reproducibility and repeatability through standardisation
- ✓ Easy-to-understand software at no charge
- ✓ Broad measuring range
- ✓ Satisfactory recovery rate: 80 -110 %
- ✓ Competent customer support

### Reliable results

The direct comparison between measurements with AflaREAD™ or OtaREAD™ to those with immunoaffinity columns and HPLC/FLD shows a good correlation (see tables). The rapid tests deliver reliable results.

Even with difficult matrices, such as roast coffee, the measurements with ELISA barely differ from those with HPLC:

Sample	ELISA [ppb]	HPLC [ppb]
Roast coffee	5.2	5.6
	5.8	5.9

*Direct comparison between measurements with OtaREAD™ and those with immunoaffinity columns and HPLC/FLD; certified reference material with 6.1 ± 0.6 ppb (BD475).*



Are you currently introducing mycotoxin analysis into your laboratory?

**We gladly offer our support!**

# AflaREAD™

For the detection of aflatoxin B1



# AflaREAD fast

Exceptionally fast test for peanuts and maize



Sample	AflaREAD™ [ppb]	HPLC [ppb]
Rice	< LOQ*	0
	4.1	3.9
	10.6	9.0
Peanut butter	< LOQ*	0
	2.7	3.2
	11.3	11.7
Brazil nut	< LOQ*	0
	4.5	4.0
	8.0	7.5
Pasta	< LOQ*	0
	3.2	3.7
	8.5	7.6

Direct comparison between measurements with the rapid test AflaREAD™ and those with IAC columns and HPLC/FLD

\* LOQ = limit of quantification

# OtaREAD™

For the detection of Ochratoxin A



# OtaREAD fast

Exceptionally fast test for peanuts and maize

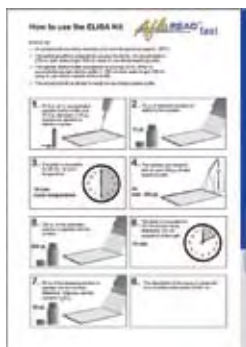
Sample	OtaREAD™ [ppb]	HPLC [ppb]
Rice	< LOQ*	0
	4.8	4.8
	9.4	9.9
Pasta	< LOQ*	0
	3.9	4.1
	6.7	8.2
Animal feed	< LOQ*	0
	4.5	4.6
	7.1	8.7

Direct comparison between measurements with the rapid test OtaREAD™ and those with IAC columns and HPLC/FLD

\* LOQ = limit of quantification

## Helpful manuals

An extensive manual and a set of clear brief instructions lead through the detection with the ELISA rapid test.



## Fast results

For immediate and easy reading of your results, we recommend our flexible, robust and transportable LCTech photometer.



# Photochemical Derivatization

## Perfect Aflatoxin Analysis at an Attractive Price



**No sensible alternative.**

*Simpler, more robust and faster than any other comparable method for this kind of analysis.*

### Canny and proven

UVE™ is suitable for the photochemical post-column derivatization of aflatoxins.

The result is a distinctly enhanced signal for the important aflatoxins G1 and B1.

The method is accepted by the AOAC, is successfully employed in inter-laboratory trials and in accredited laboratories worldwide.

### The alternative to Cobra-cell

Photochemical derivatization has advantages over electrochemical bromination. This was shown by Muscarella et al. (see pg. 13).

The big plus point in comparison: The water present is used as reagent. Neither iodine nor  $\text{HNO}_3/\text{KBr}$  are being used.

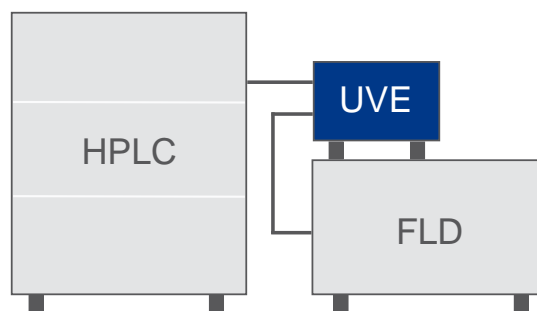
### Advantages at a glance

- ✓ No reagents needed
- ✓ Can be used together with any HPLC
- ✓ Components are designed to sustain operation of over several thousand hours.
- ✓ Simple confirmation analysis after switch-off of the reactor
- ✓ Multiple safety features
- ✓ No time-consuming rinsing after usage
- ✓ Inexpensive and low maintenance

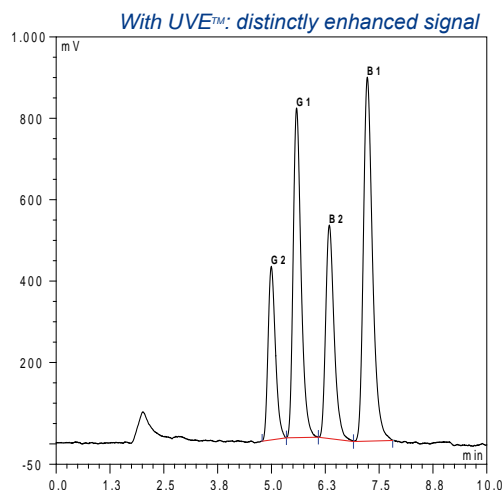
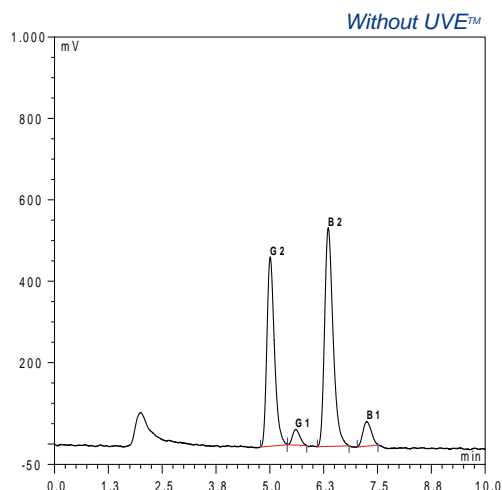
UVE™ is a small, handy device  
- 15 cm wide, 9 cm high, 27 cm deep.



*Easiest installation:*  
Connect with HPLC and detector, switch on, ready.



Ordering information	Product N°
<b>UVE™</b>	10519 (230 VAC)
Photochemical reactor for the analysis of aflatoxins, 254 nm lamp	10742 (90-126 VAC)



*The derivatization of the aflatoxins B1 and G1 to stable fluorescent derivatives is performed with UV-light in a special reactor loop made from completely inert material.*

*Subsequent detection is conducted at 365 / 460 nm (FLD).*

# Post-Column Derivatization with PICKERING

## For the Perfect Mycotoxin Analysis with HPLC

### The professional system: PINNACLE PCX

The PINNACLE PCX by PICKERING Laboratories is a professional system for post-column derivatization within mycotoxin analysis.

Substances that are not or only barely visible for the detector react after separation with a reagent. Thereby the detection sensitivity is significantly increased.

This method is suitable for the detection of aflatoxins, fumonisins, ochratoxin A and deoxynivalenol.

### What happens during derivatization

**Aflatoxins B1 and G1** are transformed to stable fluorescent derivatives using an aqueous iodine solution.

An alkaline shift of the pH increases the fluorescence of **ochratoxin A** significantly.

**Fumonisins** are transformed into fluorescent isoindole derivatives by a complex reaction targeting their amine functions.

**Formaldehyde** is initially split off from deoxynivalenol, which is subsequently transformed to a fluorescent lutidine derivative.

### Broad range of applications

The PINNACLE PCX can be used with all common HPLC brands.

It can be easily adapted to every required application - by simple and fast exchange of the reactor and selection of the storable method via software.

Detailed protocols are available for the individual mycotoxins.

The PINNACLE PCX for professional post-column derivatization



### Advantages at a glance

- ✓ Significantly improved detection limit through derivatization
- ✓ Enhanced sensitivity
- ✓ Pulse-free base line attributable to injection pump
- ✓ Simple handling: can be supervised by less experienced lab staff
- ✓ Low maintenance: no delicate wearing parts
- ✓ Automated system rinsing
- ✓ Chemically inert
- ✓ Matrix insensitivity

Ordering information	Product N°
<b>PINNACLE PCX</b> Professional system for post-column derivatization	
Aflatoxins, 1.4 mL reactor, single pump	1153-1032
Ochratoxin A, 0.15 mL reactor, single pump	1153-1012
Fumonisins, 0.5 mL reactor, single pump	1153-1022
Trichothecene, spec. reactor, dual pump	1153-1072

# Vacuum Manifold EluVac™

## Parallelized Clean-Up via Immunoaffinity Columns

### More samples in less time

The vacuum manifold EluVac™ allows the simultaneous clean-up of up to 20 samples under vacuum in preparation for mycotoxin analysis.

Thus, sample throughput in the laboratory can be significantly increased with little effort.

### Flexible and adaptable

Effortless and quick, the EluVac™ can be adapted to various applications for solid phase extraction in environmental, food and feed analysis. For these purposes sample racks for different vials are available from LCTech.

Another detail provides flexibility: For waste collection either a central 600 mL beaker or a pipe connected to an external reservoir are used. As a result of this, the EluVac™ is also suitable for larger sample volumes, e.g. milk or water samples.

### Comfortable handling

System operation of the EluVac™ is very easy.

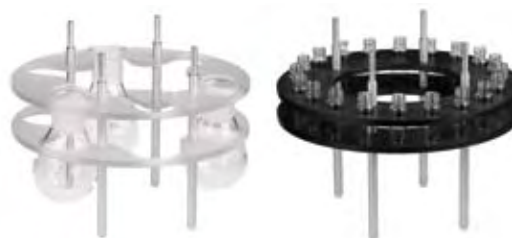
One big plus point: By simply turning the lid you can switch from “waste” to “collect” position without disassembling the device.

### Advantages at a glance

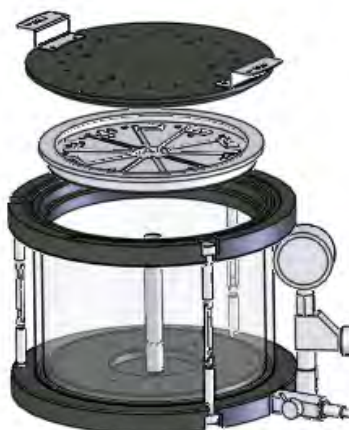
- ✓ Valuable time and cost saving due to enhanced sample throughput
- ✓ Robust and suitable for daily laboratory routine work
- ✓ Chemically resistant
- ✓ For large sample volumes corresponding reservoirs are available



*EluVac™,  
Vacuum manifold by LCTech*



*Sample racks for different vials make the system adaptable to many challenges.*



*For waste collection: a beaker or - as shown here - a central pipe that can be connected to a Woulff's bottle.*

#### Ordering information

#### Product N°

**EluVac™ Vacuum manifold set**  
containing system, sample rack  
and collection rack for 4 mL vials

12415

*Further sets and racks on request*

# Selected HPLC Column

## For the Analysis of Aflatoxins B1, B2, G1 and G2

### Reduced operation time

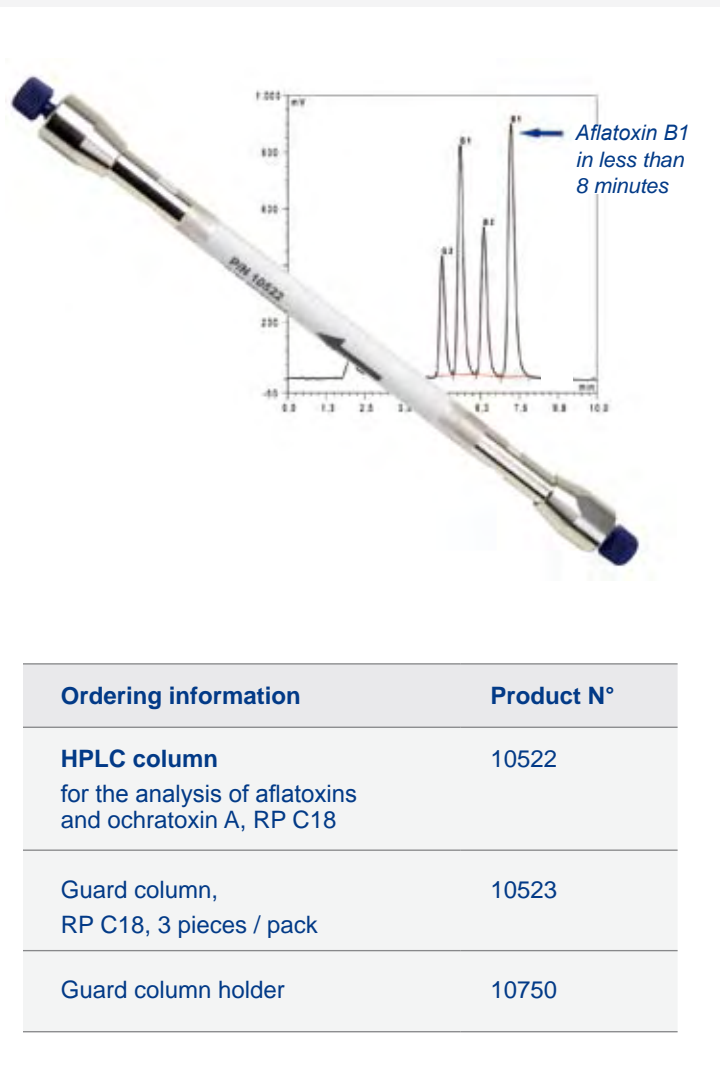
A guaranteed theoretical plate number of at least 120,000 ensures good base-line separation with short running times - aflatoxin B1 already elutes in less than 8 minutes.

The LCTech HPLC column significantly reduces your analysis time. You can make savings in two ways: On the one hand the columns themselves are inexpensive and on the other shorter processing times incur less consumption of eluents.

The column can also be used for the analysis of ochratoxin A.

In order to protect the HPLC column from clogging in the long term, it is highly recommended to use a guard column to capture any remaining matrix compounds prior to the analytical column.

We will be pleased to send you suitable isocratic methods on request.



### All-inclusive!

*Synchronised analysis of aflatoxins with LCTech immunoaffinity-columns, HPLC columns, photochemical derivatization and all together with excellent customer support.*

# Customer Support

## From Sample Preparation to Analysis

### Support in every aspect

We run our own laboratory for all applications here in Dorfen and maintain close contact with our customers using our products.

Both aspects contributed to our extensive experience built over the years in the field of mycotoxin analysis.

With this in mind, we will be pleased to support all your enquiries and/or requests.

Regardless whether you recently introduced this analysis in your laboratory or whether you are currently dealing with a particularly difficult and unusual matrix – we will always do our best to help.

### Support materials

Many different matrices, be it amaranthus or cinnamon, have been tested in our laboratory.

The knowledge won from these tests has been compiled in recommendations explaining how to deal best with the clean-ups of the respective matrices.

Extensive user manuals for our product range can be supplied on request free of charge.

Would you like to find out more about post-column derivatization within mycotoxin analysis? Detailed information is available to you at any time.

### Your direct contact to LCTech

It will take only one phone call or e-mail to have your question directly in the laboratory.

Do you need to ask questions or would you like to make suggestions concerning our products? We will be there for you at any time.

### One of our customers wrote:

*"Thank you so much for your speedy assistance as always and the great interest you take in our concerns.*

*Your help is invaluable to us and it feels quite refreshing and makes a welcome change to having found a company ready to support our applications with such enthusiasm.*

*Thank you again!"*



*Amaranthus or cinnamon*



*Extensive user manuals*



*We guarantee our customers to answer to an enquiry within 24 hours.*



Dr. Uwe Aulwurm,  
Head of Applications

Tel. +49 (0)8081 93 68 82  
mycotoxins@LCTech.de

# Chosen References for Our Products

AOAC Official Method 2005.08, **Aflatoxins in corn, raw peanuts and peanut butter**

FAPAS Proficiency Test 0490 Report, **Aflatoxin analysis in pistachio**, Juni - August 2006

FAPAS Proficiency Test 04148 Report, **Aflatoxins B & G in maize**, October - November 2009

Maragos, C.M., 2009, Mycotoxin Research, **Photoreaction of indole-containing mycotoxins to fluorescent products**. 25(2):67-75.

Muscarella, M. et al., Food Additives and Contaminants, Vol. 26, No. 10, October 2009, 1402-1410, **Validation of a confirmatory analytical method for the determination of aflatoxins B1, B2, G1 and G2 in foods and feed materials by HPLC with on-line photochemical derivatization and fluorescence detection**

Ofitserova, M. et al., J AOAC Int. 2009, Jan-Feb; 92 (1), 15-25, **Multiresidue mycotoxin analysis in corn grain by column high-performance liquid chromatography with postcolumn photochemical and chemical derivatization: Single laboratory validation**

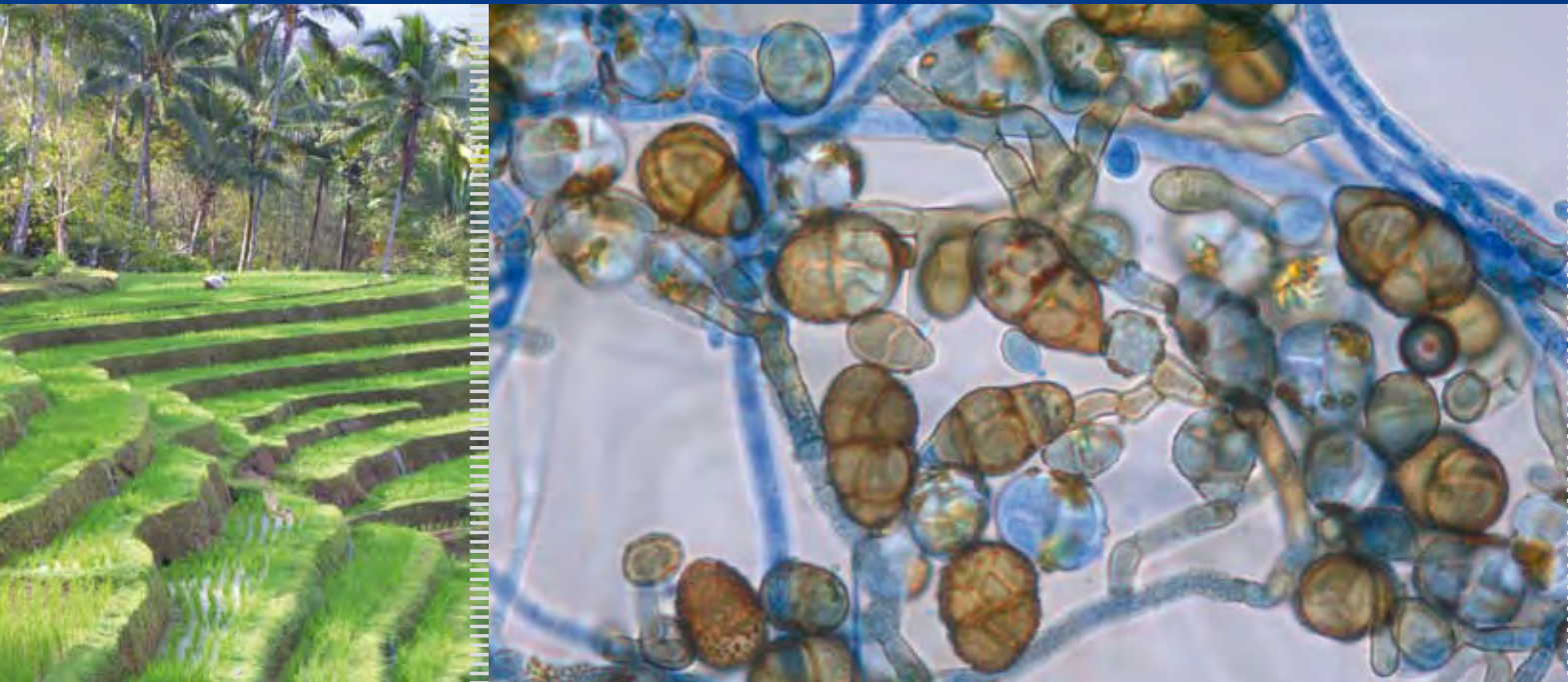
Papadopoulou-Bouraoui A., Stroka J., Anklam E., J., AOAC Int. Vol. 85, No. 2, 2002, 411-416, **Comparison of two post-column derivatization systems, ultraviolet irradiation and electrochemical determination, for the liquid chromatographic determination of aflatoxins in food**

Reiter, E.V. et al., 2009, **Aflatoxins in palm kernel cake from Indonesia – Applicability of ELISA in contrast to HPLC** 53-53.- 31st Mycotoxin Workshop; June 15–17, 2009; Münster, Germany

Reiter E.V. et al., **A limited survey of aflatoxins in rice products marketed in Vienna**, 31st Mycotoxin Workshop; June 15–17, 2009; Münster, Germany

Trucksess, M.W. et al., J AOAC Int. 2007 Jul-Aug; 90 (4) 1042-9, **Use of mycotoxin columns for determination of aflatoxins and ochratoxin A in ginseng and ginger**

Vukovic, G. L. et al., Arch. Biol. Sci, Belgrade, 61 (4), 639 - 644, 2009, **Comparison of two sample preparation procedures for HPLC determination of Ochratoxin A**



## **LCTech GmbH**

Bahnweg 41  
84405 Dorfen, Germany

Tel. +49 (0)8081 / 9368-0  
Fax +49 (0)8081 / 9368-10

[info@LCTech.de](mailto:info@LCTech.de)

**Visit us on [www.LCTech.de](http://www.LCTech.de)**

## **And a distributor nearby**

We reserve the right for technical changes.  
LCTech assumes no liability for the above  
and the illustrated application examples.

© LCTech GmbH, Germany  
P/N 12278, as of October 2010

Distributed by ARC Sciences Ltd., PO Box275, Alton, Hampshire, GU4 9FJ – t:01420 549922  
[enquiries@arcsciences.com](mailto:enquiries@arcsciences.com)  
[www.arcsciences.com](http://www.arcsciences.com)

**SOLUTIONS BY** 