

sample **PREP** 

SAMPLE PREPARATION PRODUCTS



### INTRODUCING

### FREESTYLE WORKSTATION

Freestyle is a workstation platform for many automated sample clean-up tasks. Available automated features are Gel Permeation Chromatography (GPC), Solid Phase Extraction (SPE), evaporation and concentrations (EVA), and liquid handling routines.

The basic workstation begins with a liquid handling robot, software and rack space to add components to build the configuration to handle your sample clean-up needs. Add modules to add the functionality you need to simplify sample clean-up.

Automating your sample clean-up eliminates inconsistencies and errors that require expensive rework and wasted time. The productivity times are significant as the higher value work can be performed while the system works un-attended. Your team is made safer with reduced exposure to health and safety issues inherent to repetitive motion and chemical exposures.

#### FEATURE HIGHLIGHTS

- ➡ LIQUID HANDLING
- ➡ GEL PERMEATION CHROMATOGRAPHY (GPC)
- ✤ SOLID PHASE EXTRACTION (SPE)
- ➡ EVAPORATION/CONCENTRATION
- ➡ FULLY AUTOMATED AND INTEGRATED FEATURES
- SIZES SIMULTANEOUSLY





#### BASE

The base unit includes liquid handling functionality of an X-Y-Z robot arm, rack rail to mount bottle racks, valves for up to 6 solvents, fluid handling needle system with wash and sample loops. This is the foundation on which additional modules can be added including: SPE handling, GPC processing and Evaporation functions.

SPE The SPE Module includes additional robot arm for handling SPE cartridges with airtight holder seal for positive pressure operations. The two robot arm system is capable of "Hold and Inject" of the SPE cartridge Software to program the SPE functions of conditioning, loading, washing, drying, eluting. Column drying with Nitrogen or air.



#### EVA

The EVA module enables evaporation, concentration, solvent exchange functionality. The sophisticated evaporation chamber has a complex orbital drying action to slowly evaporate highly volatile samples down to 0.5 ml. Nitrogen blow-down can be combined with vacuum for high recoveries while Quantitative transfer enables 100% of sample to be injected into the evaporation chamber.





#### GPC

The GPC Module enables Gel Permeation Chromatographic sample clean-up with optional column switching valve for multiple columns. The software can program 5 different modes of injection. User defined fractionations of the main run. Add the evaporation module EVA for concentration and solvent exchange.



#### **GPC+SPE+EVA**

The FREESTYLE completely configured is a powerful productivity tool for automated unattended sample clean-up tasks. GPC processing can be combined with SPE and evaporation for complex programs. All sample clean-up routines are performed precisely, reproducibly and safely providing the best quality samples for analysis.

#### "BETTER ANALYSIS QUALITY BECAUSE THE SAMPLE CLEAN-UP IS AUTOMATED. PRECISE AND OPTIMIZED. THE PRODUCTIVITY GAINS ARE SIGNIFICANT."



#### ANY COMBINATION, AT ANY TIME

The mechanism for positioning the sample racks into the system is unique on the market (patent registered) and in combination with the intelligent software allows for flexibility, which has never been possible before.





The frame is available in two versions (10 or 12 cm wide). It can be used for different glass types.







THE DIRECT ADVANTAGE The FREESTYLE can operate glass sizes

#### **EQUIPPING THE RACK IS EASY**

The racks are quickly and easily assembled on the system. No tools necessary! Then the user simply informs the software about the rack positions and handling instructions. The system automatically handles the rest. In case there is an urgent sample, it can easily be given top priority.



The samples are positioned into the tray. The sample numbers are etched into it.



By simply putting the tray into the frame the rack is completed. It can directly be positioned into the FREESTYLE system.

from 1 mL to 1000 mL in any combination.



This number of rack position (15 in this example) corresponds to the one in the software.

	GLASS WARE TYPES AND MAXIMUM NUMBER			
	GLASS TYPE & SIZE	MAX NUMBER /RAIL SIZE 740 MM	MAX NUMBER / RAIL SIZE 1240 MM	
<u> </u>	Sample Vials			
	1 mL (GC)	90	180	
	4 mL	56	84	
	5 mL round bottom	30	60	
	16 mL	15	30	
Π	Test Tubes			
	75 x 12 mm	90	180	
U	100 x 16 mm	90	180	
	Turbo-Vap Flasks			
	50 mL	56	84	
	200 mL	25	40	
	Laboratory Bottles			
	60 mL (Dionex ASE)	90	150	
	100 mL	56	84	
	250 mL	30	60	
	500 mL	15	30	
	1000 mL	12	24	
	Rotary Evaporator Flasks			
	100 mL with NS 14/23	30	60	
	100 mL with NS 29/32	30	60	
	250 mL with NS 29/32	24	40	
	500 mL with NS 29/32	12	30	
	1000 mL with NS 29/32	12	24	

#### **THE SOFTWARE - UNLIMITED POSSIBILITIES**

The software of the FREESTYLE is the most flexible one available for sample preparation systems. It offers comprehensive possibilities for all requirements in GPC, SPE, and online Evaporation.

- In the Method Edit screen, an individual method can be determined for each sample of the sequence, shown directly in the flow scheme and with immediate plausibility checks.
- UV chromatograms can be displayed, enlarged and overlaid.
- A report generation allows exporting PDF files for methods, columns and samples.
- All previously run samples are traceable over the long term in compliance with Good Manufacturing and Laboratory Practices. Data is stored in detailed log files which can be exported with the reports.

• and much more.





## FREESTYLE SPE

#### SPE AUTOMATION WITH MULTIPLE PROCESS OPTIONS

for best results.

Addition of the FREESTYLE GPC module enables GPC to SPE processing.

#### AUTOMATED SOLID PHASE EXTRACTION

The new generation of LCTech Systems allows for unique flexibility all due to new mechanics and software.

The compactly designed evaporation module is built up of an evapora-The sample preparation systems are designed for the fully automated tion chamber, an integrated, extremely quiet membrane pump with handling of foods and feeds, environmental samples, and other comvacuum control, a cooler for solvent recovery and a sensor system for parable tasks round the clock. the accurate measurement of final volume.

The FREESTYLE<sup>™</sup> SPE automates all processes of solid phase extraction (SPE) - if desired in combination with evaporation and solvent exchange.

The FREESTYLE<sup>™</sup> SPE handles SPE and immunoaffinity columns of diverse manufacturers.

The columns can be placed into the system with or without caps.

#### MODULE FOR EVAPORATION, WITH **ONLINE CONNECTION TO SPE**

The FREESTYLE<sup>™</sup> SPE can be supplemented with a module for EVAporation anytime and easily.

The module can concentrate samples of undefined volumes (max. 330 mL) to any end volume between 0.5 mL and 5 mL (in steps of 0.1 mL).

For this purpose two evaporation procedures are available:

- Vacuum with regulated heating

- Nitrogen blow-down (or air) with or without regulated heating

Solvent exchange is possible (liquid/liquid or evaporation to dryness and taking up a new solvent).

Thus, the user has many different possibilities

- of aliquotation

### The FREESTYLE SPE instrument combines ease of programming with multiple process options including conditioning, loading, washing, drying, and eluting. With each step the ability to optimize

- of automated solvent exchange
- of quantitative transfer

The result: Following a defined, reproducible procedure the concentrated sample at the desired end volume is ready for further treatment.

With the software of the FREESTYLE<sup>™</sup> EVAporation all individual steps of the evaporation process can be controlled in detail.





Solid phase extraction (SPE) often is the method of choice for cleaning up and concentrating analytes. It stands out due to flexibility, selectivity, rapidity and

last but not least, low solvent consumption. Automating SPE results in more reproducible results and fewer mistakes.

## **FREESTYLE EVAporation**

EVAPORATION AUTOMATION PRECISION AND FLEXIBILITY

Innovative design of the Orbital rotational Evaporation Chamber produces sample results of 0.5 mL to 5 mL

Combine with the FREESTYLE GPC + SPE + EVA for complete system of automated functions.

#### THE NEW STEP INTO EVAPORATION

The FREESTYLE<sup>™</sup> EVAporation can concentrate samples of undefined volumes (max. 330 mL) to any end volume between 0.5 mL and 5 mL (in steps of 0.1 mL).

- For this purpose two evaporation procedures are available:
- Vacuum with regulated heating
- Nitrogen blow-down (or air) with or without regulated heating

Both procedures can also be combined in one method - it is only necessary to adapt the software accordingly.

Solvent exchange is also possible (liquid/liquid or evaporation to dryness and taking up a new solvent).

Thus, the user has many different possibilities of

- aliquotation
- automated solvent exchange
- quantitative transfer

The result: Following a defined, reproducible procedure the concentrated sample at the desired end volume is ready for further treatment.



FREE STYLE

The system is available in two versions with differing usable space according to your requirements.



## **FREESTYLE GPC**

PRECISE AND EFFICIENT GPC AUTOMATION

The FREESTYLE GPC instrument innovates Gel permeation chromatography for sample clean-up. Using patented robot handling and innovative user software multiple GPC tasks are programmed for unattended operations.

Addition of the FREESTYLE SPE module and EVA evaporation chamber enables additional functionality.

#### **EFFICIENT SAMPLE CLEAN-UP**

The FREESTYLE<sup>™</sup> GPC automatically cleans up raw extracts and removes interfering matrix components such as; lipids, pigments, such or humic acids. The system is universally used for sample clean-up analysis of: food, feed, soil, environmental samples.

Gel permeation chromatography (GPC) is specified as the clean-up ste in many official methods. This robust procedure is still the best solution for difficult matrices such as animal tissues, fatty food, spices, and sediments.

#### VALUE ADD OF FLEXIBILITY

The workstation is designed to integrate hardware and software to offer extraordinary flexibility. The unique glass ware rack design enable glass sizes from 1 mL to 1000 mL along with a variety of shapes fro round bottle roto-vap to standard vials. Racks can be heated or cool as needed.

Liquid handling features include all classical injection procedures, including sample loop overfill and direct injection. Quantitative transf to several glasses, and fractionation to different glass types and sizes are also possible.

#### **IN-LINE EVAPORATION CONCENTRATION**

gars for	Add the FREESTYLE <sup>TM</sup> EVA module to the workstation to include the automated function of evaporation or concentration features. Your sample can be separated in the GPC module then concentrated down to 0.5 mL or 5 mL (in steps of 0.1 mL)
tep n	The FREESTYLE™ GPC meets the requirements of the following protocols:
	USEPA SW-846 Method 3640A
	• USFDA, USDA/FSIS CLG-CHC3, EN 1528, EN 12393, L00.0034
	• AOAC 984.21
bles om ed	• DFG S19
er	

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# **GPC QUATTRO**

#### PARALLEL PROCESSING FOR GPC SAMPLE CLEAN-UP

Gel permeation chromatography is a well-known technology for the removal of fats, proteins, and other large bio-molecules from samples in order to prevent interference in the analysis of chlorinated hydrocarbon pesticides, PCBs, antibiotics, mycotoxins, polyaromatic hydrocarbons (PAH), and other semi-volatile compounds.

The GPC Quattro Gel Permeation Chromatography (GPC) technology for the clean-up of complex animal tissues, food products, and environmental samples. The high recoveries and concentrated samples are easily analyzed by GC, GC-MS, HPLC or LC-MS.

Ideally suited for high-throughput laboratories requiring reliability and reproducibility, the GPC Quattro is designed for 4 times the productivity of a single column system. Engineered for robustness and low maintenance, the GPC Quattro provides the ease of use necessary for increased throughput and worry-free operations.

#### FEATURE HIGHLIGHTS

- ◆ 4 COLUMNS FOR PARALLEL PROCESSING OR INDIVIDUAL PROCESSING
- ➡ TOUCHSCREEN OPERATION OR PC SOFTWARE OPERATION
- RUN-TIME FAIL-SAFE FEATURE SAVES PROGRAMMING IF INTERRUPTED
- → WASTE LEVEL SENSORS
- ➡ REPRODUCIBLE HIGH RECOVERIES
- ➡ SMALL FOOTPRINT



GPC

Parallel processing in four separately programmable columns improves productivity by 400 % at a fraction of the cost of four 1-column systems.

### SPECIFICATIONS

- ➡ DIMENSIONS
- Stand Alone System
- W x D x H; 65 x 45 x 48 cm: Without Column
- POWER SUPPLY
- 88 245 V Wide Range Power Supply
- ✤ SOLVENT WETTED PARTS
- Stainless Steel
- Ceramics
- PTFE
- ➡ GPC PUMP
- 4 Individual Preparative Pumps
- 62 bar/900 psi Maximum Pressure
- Dual-Piston Pump
- Flow Rate: 1 40 mL/min
- 4 Manual Injection And Switching Of Injection Valve
- ➡ SAMPLE LOOP
  - Standard Is Four 5.0 mL Loops; Others On Request
- ♦ PARAMETERIZATION
- Flow Rate: 1 40 mL/min
- Forerun: 0 999 min
- Main Run: 0 999 min
- Tailings: 0 999 min
- Global Minimum Pressure in bar or psi
- Maximum Pressure for Each Individual Column in bar or psi
- Methods/Names Assigned To Each Column
- DISPLAY
- Touchscreen With Color And Graphic Support And Function Keys
- Simulated Alphanumeric Input Via Touchscreen
- Integrated Method Management With Input Of New Methods And Names
- System Activity Via Symbols
- Color Coded Status Of Forerun, Main Run And Tailings For Each Individual Column
- Actual Flow Path And Pressure Highlighted In Red
- Time Bar Showing Elapsed Run Time
- Remaining Run Time Via Figures
- Actual And Set Maximum Pressure For Each Column
- Errors By Symbol (Language Independent) In The Screen Of The Process Engineering
- Chronological List Of Errors In Clear Text By Pressing F2

- SAFETY FEATURES AND ERROR MANAGEMENT
  High And Low Pressure Shut-Off
- Waste Level Sensor With Shut-Off
- Defined "Load" And "Inject" Position With Safety Timer (Calculates minimum time from flow rate and sample loop size for re-switching to "load" position)
- External Columns And Liquid Strictly Separated From Electric Compartment
- Easy Access To Pump Housing From Top By Lifting Electric Compartment
- Password Protected System Setup
- In Case Of Power Failure Timer Values Are Stored ‡ Resume Or Stop Process
- Reset Of Timers When Run Was Aborted
- Manual Switch For Eluate Valve For Rinsing Purpose In "Load" Position
- Air Exhaust Louver At Rear Panel
- Main Switch To The Right Of The Display

#### ➡ UPGRADES

- Easy Upgrading Of General Software By CF Card
- Upgrade 1: Individual Programming Of Each Column
- Upgrade 2: Four Waste Level Sensors
- Upgrade 3: Data And Process Visualization On PC Via VNC Viewer



Parallel Processing or Individual Processing with Quattro GPC

#### **SPECIFICATIONS**

MATERIALS	Glass, PTFE, aluminum and acetal, solvent resistance of all parts
FILTER FRITS	10 μm, PTFE, exchangeable
SCREWED FITTINGS	UNF 1/4" - 28 (standard lab screw connection)
PRESSURE	20 bars at continuous operation, other pressures on request (40 bars at short term operation)



#### LCTech GPC Columns - Tested Quality

FILLED GPC COLUMNS					
P/N	DIMENSIONS (TL X OD X ID)*	BIO-BEADS S-X3 FILLING	BED LENGTH	SOLVENT**	METHOD (E.G.)
GPC10011	500 x 40 mm 25 mm	50 g	320 mm	EA/CY 1/1	DFG S19
GPC30011	660 x 40 mm 25 mm	70 g	450 mm	EA/CY 1/1	Modified USEPA 3640 A
GPC40011	425 x 40 mm 20 mm	24 g	225 mm	EA/CP 7/3	FSIS CLG-CHC3
GPC50011	780 x 55 mm 25 mm	70 g	540 mm	DC	USEPA 3640 A, EPA Method 8270 C, 8141 B
GPC90011	500 x 40 mm 25 mm	35 g	200 mm	DC/HX 1/1	USP Monographs: Lanolin

\* TL = Total Length, OD = Outer Diameter, ID = Inner Diameter

\*\* CY = Cyclohexane; CP = Cyclopentane; DC = Dichlorometane; EA = Ethyl Acetate; HX = Hexane, Mixing ratio on volume basis

# **GEL PERMEATION COLUMNS**

### GPC COLUMNS; FUNCTIONALITY THROUGH AND THROUGH

The LCTech GPC columns are designed for easy and self-explanatory handling. Due to their robustness they can be used for every-day analysis in laboratories.

The columns are available filled or unfilled as well as in different lengths and filling heights. Suitable filling kits are provided for easy refilling.

### MORE INFORMATION ABOUT LC TECH COLUMNS

The Advantages of the New LCTech-Column - Functionality with every Millimeter

- ◆ LEAK TIGHTNESS DUE TO SOPHISTICATED CONSTRUCTION WITH A FEW SEALING ELEMENTS ONLY
- ➡ SIMPLE AND SELF-EXPLANATORY CONSTRUCTION
- ➡ ROBUST LAYOUT
- ➡ PRESSURE STABLE (20 BARS AT CONTINUOUS OPERATION AND 40 BARS AT SHORT TERM OPERATION)
- ✤ NO CROSS-CONTAMINATION IN SUBSEQUENT SAMPLES EVEN WITH DEMANDING SAMPLES
- ➡ CHEMICALLY INERT
- ➡ EXCHANGEABLE 10 MM PTFE FRITS
- ➡ AVAILABLE READY-TO-USE & EASILY REFILLABLE
- ➡ DFG S19-COMPLIANCE (D25)





Ethylacetate/Cyclohexane 5.0 mL/min Injection Volume 5 mL UV Detection at 254 nm

1.	Corn Oil	25 g/L
2.	Di (2-Ethylhexyl) Phthalate	1 g/L
3.	Methoxychlor	0.2 g/L
4.	Perylene	0.02 g/L

To each filled LCTech GPC Column a QA chromatogram is attached, showing the perfect separation of the test components.



#### VACUUM MANIFOLD FOR SOLID PHASE EXTRACTION (SPE)

The SPE vacuum manifold EluVac is designed for enriching and isolating analytes with solid phase extraction (SPE). It allows simultaneous handling of up to 20 samples with controlled, reproducible flow rate.

biotechnology or materials research.

#### FEATURE HIGHLIGHTS

- ➡ LAB SCALE THROUGHPUT IMPROVEMENTS
- ✤ CONSISTENT CLEAN-UP WITH COMPARABLE RESULTS: The vacuum can be regulated for the whole system and using the provided column valves for each column.
- ➡ ADAPTABLE TO MANY APPLICATIONS Several racks for a variety of vials (from 1 mL to 100 mL) to collect eluates
- ♦ EASY SWITCHING Switch from "Inject" to "Load" by simply moving the lid
- ➡ HANDLING OF LARGE VOLUME ELUATES UP TO 100 ML PER SAMPLE
- ✤ SUITABLE FOR ROTARY EVAPORATOR BOTTLES UP TO 100 ML
- ➡ HANDLING OF LARGE SAMPLE LOADING VOLUMES UP TO 1000 ML

#### SETS FOR MYCOTOXIN ANALYSIS

Mycotoxins are metabolites that are produced by molds, e.g. during

EluVac™ Vacuum Manifold Set for mycotoxin analysis, consists of	12415	12856
EluVac™ Basic System	11048	11048
Rack for eluate collection in 4 mL vials, 20 positions	11105	11105
Holder for sample reservoirs	11098	11098
Insert for taking up 1 mL vials		12820



EluVac <sup>™</sup> Vacuum Manifold Set for large volume samples, e.g. water, milk, consists of		
EluVac™ Basic System	11048	10 x SPE column adap for all 1, 3, 6 and 15 ml with suction tubing (1.5
Rack for eluate collection in 4 mL vials, 20 positions	11105	Woulff bottle, 10 L, plas with tubing (2 m)

Further recommended accessories: 4 mL vials (P/N V0004, 100 pieces/pack), vacuum pump



AUTOMATED SAMPLE CLEAN-UP

## AcceCLEAN

THREE NEEDLE PARALLEL SAMPLE CLEAN-UP FOR IMMUNOAFFINITY COLUMNS

The LCTech AcceCLEAN processes up to 30 samples in one batch, three samples simultaneously. Sample clean-up of crude extracts for a broad range of matrices is performed using immunoaffinity columns.

### FEATURE HIGHLIGHTS

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- ✤ THREE PARALLEL OPERATING NEEDLES
- ✤ NO CROSS-CONTAMINATION OR CARRY-OVER FROM SAMPLE-TO-SAMPLE
- ➡ EIGHT-PORT VALVE ENABLES SEVEN DIFFERENT SOLVENTS IN ADDITION TO AIR FLOW
- ➡ RACK PLATFORM WITH UP TO TEN RACKS, 3 SAMPLES EACH
- ➡ DIFFERENT METHOD FOR EACH RACK AVAILABLE
- ➡ HOLDS UP TO 50 STORED METHODS
- ✤ RUGGED CONSTRUCTION FOR LOW MAINTENANCE AND CONTINUOUS OPERATION
- ➡ EASY-TO-USE KEYPAD OPERATION
- ➡ 1 ML, 3 ML, 6 ML / COLUMNS
- ➡ SYSTEM CAN EASILY HANDLE MOST SPE COLUMNS
- ➡ COMPATIBLE WITH ANY IMMUNOAFFINITY COLUMNS
- ➡ VIRTUALLY SILENT OPERATION

### FULLY AUTOMATED HANDLING

Place your samples and columns in the AcceCLEAN™, fill the solvent reservoirs, choose the method for the sample list and press RUN.

The AcceCLEAN<sup>™</sup> will do the rest.

#### PREPARING STEPS

The samples and columns are placed into the single racks. The eluate vials are put into the elution rack and pushed into the sample rack.





Transporting piston



ELUTE

#### LOAD, WASH, DRY, DRAIN

During these working steps the waste fluids are collected directly below the columns and drained off through the AcceCLEAN<sup>™</sup> into an external bottle.

#### THE INTERMEDIATE STEP

A piston, which is integrated in the system, transports the elution rack with the eluate vials to the new position.

The elution rack is now placed directly below the columns. The eluate is collected in the eluate vials.



### SAMPLE CLEAN-UP COLUMNS

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#### IMMUNOAFFINITY SAMPLE CLEAN-UP COLUMNS

Aflatoxins and Ochratoxin A are produced by fungi, e.g. Aspergillus and Penicillium species. Therefore both toxin types are found together in many foods and animal feeds, e.g. cereals. Thus it is appropriate to analyze one extract for the occurrence of both mycotoxins in a single step.

Of significant assistance is the clean-up of extracts by a combined immunoaffinity column for both mycotoxin types in one step. The subsequent analysis may then be performed by HPLC with post-column derivatization or other techniques.

#### MYCOTOXIN SAMPLE CLEAN-UP COLUMNS

#### Aflatoxin Sample Clean-up Columns

LCTech developed immunoaffinity columns for sample clean-up of foods, grains, feeds, etc. for aflatoxin analysis using HPLC postcolumn derivatization or other techniques. The AflaCLEAN columns are selective for B1, B2, G1 and G2.

AflaCLEAN COLUMNS				
CATALOG NO.	DESCRIPTION	QTY		
10514	AflaCLEAN sample clean-up column, 3 mL	25/pkg		
11022	Alfa-OtaCLEAN™ sample clean-up column, 3 mL	25/pkg		
Maximum loading capacity in 150 ng of Aflatoxin. Shelf life is 2 years at room temperature.				

AflaCLEAN SELECT COLUMNS			
CATALOG NO.	DESCRIPTION	QTY	
10514	AflaCLEAN Select sample clean-up column, 3 mL	25/pkg	
12062	AflaCLEAN Select sample clean-up column, 1 mL	25/pkg	
Maximum loading capacity of 300 ng Aflatoxin. Shelf life is 9 months at 4 °C.			

	AflaCLEAN SMART CARTRIDGES			
CATALOG NO.	DESCRIPTION	QTY		
12862	AflaCLEAN Smart sample clean-up cartridges, 1 mL	100/pkg		
This innovative design utilizes a syringe for processing and is optimized for faster elution using less solvent. Aflatoxin sample-cleanup for Hazelnut, Peanut, Pistachio, and Corn.				

Maximum loading of 100 ng Aflatoxin. Shelf life is 6 months at 4 °C.

#### Ochratoxin Sample Clean-up Columns

LCTech developed the OtaCLEAN columns for Ochratoxin A selectivity in foods, grains, feeds, and other matrices.

OtaCLEAN COLUMNS				
CATALOG NO.	DESCRIPTION	QTY		
12425	OtaCLEAN sample clean-up column, 3 mL	25/pkg		
11022	Alfa-OtaCLEAN™ sample clean-up column, 3 mL	25/pkg		
Maximum loading capacity of 200 ng of Ochratoxin A. Shelf life is 2 years at room temperature.				

#### Deoxynivalenol Sample Clean-up Columns

LCTech developed the DONex for sample clean-up of Deoxynivalenol (DON) in a variety of matrices.

	DONex COLUMNS		
CATALOG NO.	DESCRIPTION	QTY	
12792	DONex sample clean-up column	25/pkg	
Maximum load capacity of 4 g of DON. No expiration date.			

#### Other Sample Clean-up Column Applications Glyphosate

#### • Oil-index

DONex COLUMN RECOVERIES	
RECOVERIES [%] DON	
108	
90	
101	
91	
100	
105	
100	
104	
91	
100	
99	

\* All matrices were spiked prior to the extraction. Spiking solution was incubated for at least 1 h with matrix before extraction was started. Calculation of recovery is based on subtraction of values obtained without spiking.

Recoveries for Nivalenol are similar to those observed for Deoxynivalenol.



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