Quality Control Certificate

Product: **EVOLUTION Universal Column**

Product No.: 20085

Lot No.: 721270

Storage Recommendations: Store the column at room temperature below 25°C

Description: The EVOLUTION Universal Column is part of a 3- or 4-column setup used for the sample preparation of environmental-, food- / feed- and similar matrices with DEXTech systems from LCTech for the analysis of polychlorinated dibenzo-p-dioxins (PCDD), polychlorinated dibenzofurans (PCDF) and polychlorinated biphenyl (PCB) congeners.

Quality Control Release Inspection and Test Specification

Test Procedure: A solvent blank, spiked with quantification standard has been cleaned on a DEXTech Plus system, spiked with recovery standard, evaporated with the D-EVA and has been quantified with a HRGC/HRMS DFS from Thermo Fisher Scientific at a resolution of R > 10000.

Results Blank Value:	PCDD/F-TEQ:	0,06	pg/column
		(crit: < 0,70	pg/column)
	dl-PCB-TEQ:	0,0057	pg/column
		(crit: < 0,05	pg/column)
	Sum Total PCB:	4,3	pg/column
		(crit: < 300	pg/column)

Results Recoveries:	PCDD/F	87	to	108	%	(crit:	70	to	120	%)
	PCB	75	to	103	%	(crit:	70	to	120	%)

This is to certify that the EVOLUTION Universal Column, Lot 721270, passed the required test specifications and is released for sale.

date: 13.12.2024 sign.: M. Bradis

The company LCTech GmbH is certified according to ISO 9001

LCTech GmbH
Daimlerstrasse 4, 84419 Obertaufkirchen
Germany

QC-Certificate - 20085 - 721270

Hazards:	NOT FOR HUMAN OR DRUG USE! The EVOLUTION Universal Column is designed and prepared for usage with the Alumina/Florisil Column and Carbon Column from LCTech and for laboratory use only. This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion, all procedures should be carried out with suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed according to national and regional regulations.
Quality Control:	All ingredients are traceable to certified lots of our supplier. In addition, any ingredient with a new lot will be checked on contamination and efficiency before releasing for production. Monitoring the ongoing production, several columns are chosen at random day for analysis to check on contamination and efficiency.
Quality Management:	This product was produced using a Quality Management System registered to the ISO 9001:2015 (DEKRA)
Documentation / Data Attached:	table 1 & 2: blankvalues of PCDD/F and PCB table 3 & 4: 13C-Recoveries of PCDD/F and PCB
Analytics	This is to certify that the EVOLUTION Universal Column, Lot , passed the required test specifications and is released for sale.
Remarks	Our suppliers maintain the highest standard of quality, however due to the high temperature necessary for several steps in the production, some small charred particles may be visible within a batch of silica or filters without any effect on the clean-up.

LCTech GmbH
Daimlerstrasse 4, 84419 Obertaufkirchen, Germany,
Tel +49 8082 2717 - 0, info@lctech.de, www.lctech.de

QC-Certificate - 20085 - 721270

Results:

Lockmass check: No significant disturbances, or indicators for contaminations are detected.

Blanks: n= 6

Table 1: PCDD/F blank

sample amount [pg/column]		[pg/column]
	2,3,7,8-TCDF	<0,036
	1,2,3,7,8-PeCDF	<dl
	2,3,4,7,8-PeCDF	<dl
	1,2,3,4,7,8-HxCDF	<dl
	1,2,3,6,7,8-HxCDF	<0,018
	2,3,4,6,7,8-HxCDF	<dl
	1,2,3,7,8,9-HxCDF	<dl
	1,2,3,4,6,7,8-HpCDF	<dl
	1,2,3,4,7,8,9-HpCDF	<0,018
	1,2,3,4,6,7,8,9-OCDF	<dl
	2,3,7,8-TCDD	<dl
	1,2,3,7,8-PeCDD	<dl
	1,2,3,4,7,8-HxCDD	<0,027
	1,2,3,6,7,8-HxCDD	<dl
	1,2,3,7,8,9-HxCDD	<0,027
	1,2,3,4,6,7,8-HpCDD	<0,09
	1,2,3,4,6,7,8,9-OCDD	0,18

Table 2: PCB blank

sample amount [pg/sample]		[pg/column]
	PCB-#28	1,73
	PCB-#52	1,7
	PCB-#101	0,38
	PCB-#153	0,44
	PCB-#138	<0,261
	PCB-#180	<0,18
	PCB-#81	0,05
	PCB-#77	0,082
	PCB-#126	0,0527
	PCB-#169	<0,027
	PCB-#123	0,01
	PCB-#118	0,18
	PCB-#114	0,075
	PCB-#105	0,09
	PCB-#167	0,244
	PCB-#156	0,133
	PCB-#157	0,05
	PCB-#189	0,055

PCDD/F TEQ (2005)	[pg/column]
lower bound	0,01
upper bound	0,06

PCB-TEQ	[pg/column]
lower bound	0,0057
upper bound	0,0057
Sum DIN	4,3

LCTech GmbH
Daimlerstrasse 4, 84419 Obertaufkirchen, Germany,
Tel +49 8082 2717 - 0, info@lctech.de, www.lctech.de

QC-Certificate - 20085 - 721270

Table 3: PCDD/F recoveries

PCDD/F 13C Recoveries [%]	[%]	RSD [%]
2,3,7,8-TCDF	91	1
1,2,3,7,8-PeCDF	88	4
2,3,4,7,8-PeCDF	92	5
1,2,3,4,7,8-HxCDF	96	3
1,2,3,6,7,8-HxCDF	105	4
2,3,4,6,7,8-HxCDF	104	3
1,2,3,7,8,9-HxCDF	103	5
1,2,3,4,6,7,8-HpCDF	105	4
1,2,3,4,7,8,9-HpCDF	102	4
1,2,3,4,6,7,8,9-OCDF	108	6
2,3,7,8-TCDD	87	2
1,2,3,7,8-PeCDD	97	5
1,2,3,4,7,8-HxCDD	103	3
1,2,3,6,7,8-HxCDD	89	3
1,2,3,7,8,9-HxCDD	107	4
1,2,3,4,6,7,8-HpCDD	99	3
1,2,3,4,6,7,8,9-OCDD	96	6

Table 4: PCB recoveries

PCB 13C Recoveries [%]	[%]	RSD [%]
PCB-#28	94	3
PCB-#52	103	3
PCB-#101	99	2
PCB-#153	96	3
PCB-#138	93	2
PCB-#180	97	1
PCB-#81	93	4
PCB-#77	94	4
PCB-#126	95	7
PCB-#169	98	9
PCB-#123	76	6
PCB-#118	75	9
PCB-#114	88	1
PCB-#105	82	7
PCB-#167	85	13
PCB-#156	81	8
PCB-#157	77	11
PCB-#189	82	10

LCTech GmbH
Daimlerstrasse 4, 84419 Obertaufkirchen, Germany,
Tel +49 8082 2717 - 0, info@lctech.de, www.lctech.de