Quality Control Certificate

Product:	**EVOLUTION Universal Column**
Product No.:	**20085**
Lot No.:	**717151**

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 for the sample cleanup of environmental-, food- / feed- and similar matrices. It is designed for the analysis of polychlorinated dibenzo-p-dioxins (PCDD), polychlorinated dibenzofurans (PCDF) and polychlorinated biphenyl (PCB) congeners with the DEXTech systems from LCTech GmbH

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 via 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:	0,58	pg/column
		(crit: < 0,7	pg/column)
	dl-PCB-TEQ:	0,022	pg/column
		(crit: < 0,05	pg/column)
	Sum Indikator PCB:	5,4	pg/column
		(crit: < 100	pg/column)

Results Recoveries:	PCDD/F	74	to	115	%	(crit: 70	to	120)
	PCB	80	to	96	%	(crit: 70	to	120)

This is to certify that the20085, Lot 717151, passed the required test specifications and is released for sale.

date: 30.08.2022 sign.: T. Kehemeier

The company LCTech GmbH is certified according to ISO 9001:2015

LCTech GmbH
Daimlerstraße 4
84419 Obertaufkirchen
Germany

Tel. +49 8082 2717-0
Fax +49 8082 2717-100
info@LCTech.de
www.LCTech.de

QC Certificate - EVOLUTION Universal Column - 20085 - 717151

Hazards:

NOT FOR HUMAN OR DRUG USE!

The EVOLUTIONUniversal Column is designed and prepared for usage with the Alumina/Florisil 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:	Blank values of PCDD/F and PCB
Table 3 & 4:	13C-Recoveries of PCDD/F and PCB

Analytics:

All the columns (n>5) have to perform a clean-up of a solvent blank (10 mL n-hexane), spiked with a 13C - labelled quantifier-standard solution with a single column method onto a DEXTech Plus system. The fractions 1 (PCB) and 2 (PCDD/F) are spiked with 13C - labelled recovery- standard solutions and evaporated with the D-EVA vacuum centrifuge. The extracts are measured with a HRMS-DFS from Thermo Fisher Scientific with a resolution of R > 10000. The HRGCs are equipped with 60 m DB5 MS columns. For PCDD/F 5µL are injected via PTV, for PCB 2µL via SSL.

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.

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Results:

Lockmass check:

No significant disturbances, or indicators for contaminations are detected.

Blanks:

Table 1: PCDD/F blank (n=6)

Congeneres:	[pg/column]:
2,3,7,8-TCDF	0,04
1,2,3,7,8-PeCDF	0,05
2,3,4,7,8-PeCDF	0,14
1,2,3,4,7,8-HxCDF	0,092
1,2,3,6,7,8-HxCDF	0,097
2,3,4,6,7,8-HxCDF	0,12
1,2,3,7,8,9-HxCDF	0,31
1,2,3,4,6,7,8-HpCDF	0,79
1,2,3,4,7,8,9-HpCDF	0,615
OCDF	0,07
2,3,7,8-TCDD	0,14
1,2,3,7,8-PeCDD	0,14
1,2,3,4,7,8-HxCDD	0,376
1,2,3,6,7,8-HxCDD	0,82
1,2,3,7,8,9-HxCDD	0,453
1,2,3,4,6,7,8-HpCDD	0,99
OCDD	2,1

TEQ (WHO 2005)	
lower bound	0,58
upper bound	0,58

Table 2: PCB blank (n=6)

Congeneres:	[pg/column]:
PCB 28	1,49
PCB 52	0,25
PCB 77	0,18
PCB 81	0,218
PCB 101	<dl
PCB 123	<dl
PCB 118	0,65
PCB 114	0,1769
PCB 105	0,27
PCB 126	0,1225
PCB 153	1,19
PCB 138	1,46
PCB 167	0,434
PCB 156	0,16
PCB 157	0,061
PCB 169	0,304
PCB 180	0,62
PCB 189	0,115

TEQ (WHO 2005)	
lower bound	0,0215
upper bound	0,0215

Sum DIN PCB	5,4

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Results:

13C-Recoveries

Table 3: PCDD/F 13C-recoveries (n=6)

Congeneres:	13C rec [%]
2,3,7,8-TCDF	89
1,2,3,7,8-PeCDF	84
2,3,4,7,8-PeCDF	82
1,2,3,4,7,8-HxCDF	79
1,2,3,6,7,8-HxCDF	84
2,3,4,6,7,8-HxCDF	78
1,2,3,7,8,9-HxCDF	78
1,2,3,4,6,7,8-HpCDF	104
1,2,3,4,7,8,9-HpCDF	96
OCDF	115
2,3,7,8-TCDD	83
1,2,3,7,8-PeCDD	93
1,2,3,4,7,8-HxCDD	85
1,2,3,6,7,8-HxCDD	74
1,2,3,7,8,9-HxCDD	80
1,2,3,4,6,7,8-HpCDD	106
OCDD	93

Table 4: PCB 13C-recoveries (n=6)

Congeneres:	13C rec [%]
PCB 28	93
PCB 52	96
PCB 77	92
PCB 81	92
PCB 101	80
PCB 123	90
PCB 118	84
PCB 114	92
PCB 105	86
PCB 126	92
PCB 153	96
PCB 138	95
PCB 167	85
PCB 156	89
PCB 157	86
PCB 169	90
PCB 180	91
PCB 189	82

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