Quality Control Certificate

Product:	**EVOLUTION Universal Column**
Product No.:	20085
Lot No.:	**721124**

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:	0,08	pg/column	
	(crit: <	0,70	pg/column)
dl-PCB-TEQ:	0,0154	pg/column	
	(crit: <	0,05	pg/column)
Sum Total PCB:	1,2	pg/column	
	(crit: <	300	pg/column)

Results Recoveries:

PCDD/F	83	to	105	%	(crit:	70	to	120	%)
PCB	70	to	104	%	(crit:	70	to	120	%)

This is to certify that the EVOLUTION Universal Column, Lot 721124, passed the required test specifications and is released for sale.

date: 12.11.2024   sign.: _____

Michael Brandis

The company LCTech GmbH is certified according to ISO 9001

LCTech GmbH
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page 1/4

DEKRA
certified

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.

Results:

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

Blanks: n= 6

Table 1: PCDD/F blank

	[pg/column]
2,3,7,8-TCDF	0,05
1,2,3,7,8-PeCDF	<dl
2,3,4,7,8-PeCDF	<dl
1,2,3,4,7,8-HxCDF	<0,027
1,2,3,6,7,8-HxCDF	0,033
2,3,4,6,7,8-HxCDF	<0,045
1,2,3,7,8,9-HxCDF	<0,045
1,2,3,4,6,7,8-HpCDF	0,15
1,2,3,4,7,8,9-HpCDF	0,023
1,2,3,4,6,7,8,9-OCDF	<0,054
2,3,7,8-TCDD	<dl
1,2,3,7,8-PeCDD	<dl
1,2,3,4,7,8-HxCDD	0,054
1,2,3,6,7,8-HxCDD	0,12
1,2,3,7,8,9-HxCDD	0,036
1,2,3,4,6,7,8-HpCDD	0,16
1,2,3,4,6,7,8,9-OCDD	1,41

(sample amount [pg/column])

Table 2: PCB blank

	[pg/column]
PCB-#28	0,34
PCB-#52	0,57
PCB-#101	0,27
PCB-#153	<0,162
PCB-#138	<dl
PCB-#180	<dl
PCB-#81	0,1
PCB-#77	0,432
PCB-#126	0,1346
PCB-#169	0,064
PCB-#123	<dl
PCB-#118	<0,108
PCB-#114	<0,0018
PCB-#105	<dl
PCB-#167	<dl
PCB-#156	<dl
PCB-#157	<0,018
PCB-#189	<0,0072

(sample amount [pg/sample])

PCDD/F TEQ (2005)	[pg/column]
lower bound	0,04
upper bound	0,08

PCB-TEQ	[pg/column]
lower bound	0,0154
upper bound	0,0154
Sum DIN	1,2

Table 3: PCDD/F recoveries

		[%]	RSD [%]
PCDD/F 13C Recoveries [%]	2,3,7,8-TCDF	95	2
	1,2,3,7,8-PeCDF	102	2
	2,3,4,7,8-PeCDF	92	3
	1,2,3,4,7,8-HxCDF	97	2
	1,2,3,6,7,8-HxCDF	105	2
	2,3,4,6,7,8-HxCDF	96	2
	1,2,3,7,8,9-HxCDF	96	4
	1,2,3,4,6,7,8-HpCDF	102	2
	1,2,3,4,7,8,9-HpCDF	85	4
	1,2,3,4,6,7,8,9-OCDF	100	5
	2,3,7,8-TCDD	85	6
	1,2,3,7,8-PeCDD	89	3
	1,2,3,4,7,8-HxCDD	99	2
	1,2,3,6,7,8-HxCDD	83	3
	1,2,3,7,8,9-HxCDD	94	3
	1,2,3,4,6,7,8-HpCDD	89	3
	1,2,3,4,6,7,8,9-OCDD	88	4

Table 4: PCB recoveries

		[%]	RSD [%]
PCB 13C Recoveries [%]	PCB-#28	100	3
	PCB-#52	92	2
	PCB-#101	104	3
	PCB-#153	94	2
	PCB-#138	96	2
	PCB-#180	101	2
	PCB-#81	94	3
	PCB-#77	94	3
	PCB-#126	91	6
	PCB-#169	97	7
	PCB-#123	94	7
	PCB-#118	84	14
	PCB-#114	103	4
	PCB-#105	86	9
	PCB-#167	70	17
	PCB-#156	79	11
	PCB-#157	73	14
	PCB-#189	71	14