Quality Control Certificate

Product:	**EVOLUTION Alox Column**
Product No.:	20087
Lot No.:	**717762**

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

Description:	The EVOLUTION Alumina Column is part of a 3-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:	0,2	pg/column
	(crit: < 0,7	pg/column)
dl-PCB-TEQ:	0,0404	pg/column
	(crit: < 0,05	pg/column)
Sum Indikator PCB:	8,9	pg/column
	(crit: < 100	pg/column)

Results Recoveries:

PCDD/F	87	to	113	%	(crit:	70	to	120	%)
PCB	91	to	112	%	(crit:	70	to	120	%)

This is to certify that the EVOLUTION Alox Column, Lot 20087, passed the required test specifications and is released for sale.

date: 29.11.2022   sign.: *T. Kehemeir*

The company LCTech GmbH is certified according to ISO 9001

Hazards:	NOT FOR HUMAN OR DRUG USE!
	The Alumina Column is designed and prepared for usage with the Universal/standard & Smart 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	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	n/a

Results:

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

Blanks: n=   8

Table 1: PCDD/F blank

	[pg/column]
2,3,7,8-TCDF	0,07
1,2,3,7,8-PeCDF	0,09
2,3,4,7,8-PeCDF	0,11
1,2,3,4,7,8-HxCDF	0,028
1,2,3,6,7,8-HxCDF	0,045
2,3,4,6,7,8-HxCDF	<0,045
1,2,3,7,8,9-HxCDF	0,07
1,2,3,4,6,7,8-HpCDF	<0,063
1,2,3,4,7,8,9-HpCDF	0,047
1,2,3,4,6,7,8,9-OCDF	6,39
2,3,7,8-TCDD	<0,036
1,2,3,7,8-PeCDD	0,09
1,2,3,4,7,8-HxCDD	0,038
1,2,3,6,7,8-HxCDD	<0,108
1,2,3,7,8,9-HxCDD	0,049
1,2,3,4,6,7,8-HpCDD	0,13
1,2,3,4,6,7,8,9-OCDD	0,24

(sample amount [pg/column])

PCDD/F TEQ (2005)	[pg/column]
lower bound	0,2
upper bound	0,2

Table 2: PCB blank

	[pg/column]
PCB-#28	3,77
PCB-#52	3,46
PCB-#101	0,72
PCB-#153	0,42
PCB-#138	0,33
PCB-#180	0,224
PCB-#81	<dl
PCB-#77	<dl
PCB-#126	0
PCB-#169	<dl
PCB-#123	<dl
PCB-#118	0,2
PCB-#114	0,092
PCB-#105	0,1
PCB-#167	0,062
PCB-#156	0,18
PCB-#157	0,09
PCB-#189	0,177

(sample amount [pg/sample])

PCB-TEQ	[pg/column]
lower bound	0,0404
upper bound	0,0404
Sum DIN	8,9

Table 3: PCDD/F recoveries

		[%]	RSD [%]
PCDD/F 13C Recoveries [%]	2,3,7,8-TCDF	96	6
	1,2,3,7,8-PeCDF	104	8
	2,3,4,7,8-PeCDF	104	7
	1,2,3,4,7,8-HxCDF	96	8
	1,2,3,6,7,8-HxCDF	105	10
	2,3,4,6,7,8-HxCDF	99	10
	1,2,3,7,8,9-HxCDF	102	15
	1,2,3,4,6,7,8-HpCDF	113	4
	1,2,3,4,7,8,9-HpCDF	107	10
	1,2,3,4,6,7,8,9-OCDF	96	11
	2,3,7,8-TCDD	96	5
	1,2,3,7,8-PeCDD	105	8
	1,2,3,4,7,8-HxCDD	104	10
	1,2,3,6,7,8-HxCDD	88	7
	1,2,3,7,8,9-HxCDD	104	12
	1,2,3,4,6,7,8-HpCDD	103	6
	1,2,3,4,6,7,8,9-OCDD	87	8

Table 4: PCB recoveries

		[%]	RSD [%]
PCB 13C Recoveries [%]	PCB-#28	102	5
	PCB-#52	91	9
	PCB-#101	103	4
	PCB-#153	100	5
	PCB-#138	98	4
	PCB-#180	102	3
	PCB-#81	103	0
	PCB-#77	105	0
	PCB-#126	110	0
	PCB-#169	102	0
	PCB-#123	112	7
	PCB-#118	108	7
	PCB-#114	111	7
	PCB-#105	104	6
	PCB-#167	106	3
	PCB-#156	100	3
	PCB-#157	104	3
	PCB-#189	99	3