Quality Control Certificate

Product: **EVOLUTION Alox Column**

Product No.: 20087

Lot No.: 718987

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:	0,19	pg/column
		(crit: < 0,7	pg/column)
	dl-PCB-TEQ:	0,0308	pg/column
		(crit: < 0,05	pg/column)
	Sum Total PCB:	27,5	pg/column
		(crit: < 300	pg/column)

Results Recoveries:	PCDD/F	89	to	116	%	(crit:	70	to	120	%)
	PCB	78	to	106	%	(crit:	70	to	120	%)

This is to certify that the EVOLUTION Alox Column, Lot 718987, passed the required test specifications and is released for sale.

date: 08.09.2023 sign.: M. Bradis

The company LCTech GmbH is certified according to ISO 9001

LCTech GmbH
Daimlerstrasse 4, 84419 Obertaufkirchen
Germany

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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	This is to certify that the EVOLUTION Alumina Column, Lot , passed the required test specifications and is released for sale.
Remarks	n/a

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Results:

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

Blanks: n= 10

Table 1: PCDD/F blank

sample amount [pg/column]		[pg/column]
	2,3,7,8-TCDF	<0,036
	1,2,3,7,8-PeCDF	0,08
	2,3,4,7,8-PeCDF	<0,081
	1,2,3,4,7,8-HxCDF	0,054
	1,2,3,6,7,8-HxCDF	0,06
	2,3,4,6,7,8-HxCDF	0,06
	1,2,3,7,8,9-HxCDF	0,09
	1,2,3,4,6,7,8-HpCDF	<0,063
	1,2,3,4,7,8,9-HpCDF	0,059
	1,2,3,4,6,7,8,9-OCDF	0,12
	2,3,7,8-TCDD	<0,036
	1,2,3,7,8-PeCDD	0,1
	1,2,3,4,7,8-HxCDD	0,081
	1,2,3,6,7,8-HxCDD	0,14
	1,2,3,7,8,9-HxCDD	0,088
	1,2,3,4,6,7,8-HpCDD	0,09
	1,2,3,4,6,7,8,9-OCDD	0,45

Table 2: PCB blank

sample amount [pg/sample]		[pg/column]
	PCB-#28	7,42
	PCB-#52	9,51
	PCB-#101	4,58
	PCB-#153	3,06
	PCB-#138	1,73
	PCB-#180	1,152
	PCB-#81	0,41
	PCB-#77	0,553
	PCB-#126	0,2305
	PCB-#169	0,248
	PCB-#123	0,37
	PCB-#118	1,99
	PCB-#114	0,365
	PCB-#105	0,99
	PCB-#167	0,306
	PCB-#156	0,755
	PCB-#157	0,37
	PCB-#189	0,602

PCDD/F TEQ (2005)	[pg/column]
lower bound	0,19
upper bound	0,19

PCB-TEQ	[pg/column]
lower bound	0,0308
upper bound	0,0308
Sum DIN	27,5

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Table 3: PCDD/F recoveries

PCDD/F 13C Recoveries [%]		[%]	RSD [%]
	2,3,7,8-TCDF	93	4
	1,2,3,7,8-PeCDF	89	6
	2,3,4,7,8-PeCDF	89	5
	1,2,3,4,7,8-HxCDF	108	6
	1,2,3,6,7,8-HxCDF	116	4
	2,3,4,6,7,8-HxCDF	114	4
	1,2,3,7,8,9-HxCDF	111	3
	1,2,3,4,6,7,8-HpCDF	112	4
	1,2,3,4,7,8,9-HpCDF	105	5
	1,2,3,4,6,7,8,9-OCDF	104	7
	2,3,7,8-TCDD	90	4
	1,2,3,7,8-PeCDD	89	6
	1,2,3,4,7,8-HxCDD	114	4
	1,2,3,6,7,8-HxCDD	98	5
	1,2,3,7,8,9-HxCDD	115	4
	1,2,3,4,6,7,8-HpCDD	104	4
	1,2,3,4,6,7,8,9-OCDD	98	7

Table 4: PCB recoveries

PCB 13C Recoveries [%]		[%]	RSD [%]
	PCB-#28	98	8
	PCB-#52	91	8
	PCB-#101	106	4
	PCB-#153	98	4
	PCB-#138	99	3
	PCB-#180	98	3
	PCB-#81	93	8
	PCB-#77	90	11
	PCB-#126	83	14
	PCB-#169	78	16
	PCB-#123	98	10
	PCB-#118	93	17
	PCB-#114	102	7
	PCB-#105	93	14
	PCB-#167	84	17
	PCB-#156	102	9
	PCB-#157	91	15
	PCB-#189	89	14

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