Quality Control Certificate

Product: **Alumina Column**

Product No.: 15433

Lot No.: **717258**

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

Description: The 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:	0,32 pg/column	
		(crit: < 0,7 pg/column)	
	dl-PCB-TEQ:	0,016 pg/column	
		(crit: < 0,05 pg/column)	
	Sum Indikator PCB:	9 pg/column	
		(crit: < 100 pg/column)	
Results Recoveries:	PCDD/F	90 to 112 %	(crit: 70 to 120 %)
	PCB	85 to 110 %	(crit: 70 to 120 %)

This is to certify that the Alumina Column, Lot 15433, passed the required test specifications and is released for sale.

date: 29.11.2022 sign.: T. Kechemeir

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	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

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Results:

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

Blanks: n= 8

Table 1: PCDD/F blank

sample amount [pg/column]		[pg/column]
	2,3,7,8-TCDF	0,06
	1,2,3,7,8-PeCDF	0,11
	2,3,4,7,8-PeCDF	0,13
	1,2,3,4,7,8-HxCDF	0,033
	1,2,3,6,7,8-HxCDF	0,036
	2,3,4,6,7,8-HxCDF	<0,045
	1,2,3,7,8,9-HxCDF	0,06
	1,2,3,4,6,7,8-HpCDF	0,08
	1,2,3,4,7,8,9-HpCDF	0,05
	1,2,3,4,6,7,8,9-OCDF	0,09
	2,3,7,8-TCDD	0,12
	1,2,3,7,8-PeCDD	0,11
	1,2,3,4,7,8-HxCDD	<0,027
	1,2,3,6,7,8-HxCDD	<0,108
	1,2,3,7,8,9-HxCDD	0,073
	1,2,3,4,6,7,8-HpCDD	0,14
	1,2,3,4,6,7,8,9-OCDD	0,83

PCDD/F TEQ (2005)	[pg/column]
lower bound	0,32
upper bound	0,32

Table 2: PCB blank

sample amount [pg/sample]		[pg/column]
	PCB-#28	2,12
	PCB-#52	2,81
	PCB-#101	1,51
	PCB-#153	1,59
	PCB-#138	0,6
	PCB-#180	0,351
	PCB-#81	0,11
	PCB-#77	0,295
	PCB-#126	0,1343
	PCB-#169	0,066
	PCB-#123	<0,18
	PCB-#118	0,55
	PCB-#114	0,087
	PCB-#105	0,1
	PCB-#167	0,133
	PCB-#156	0,199
	PCB-#157	0,1
	PCB-#189	0,194

PCB-TEQ	[pg/column]
lower bound	0,0156
upper bound	0,0156
Sum DIN	9

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Table 3: PCDD/F recoveries

PCDD/F 13C Recoveries [%]	[%]	RSD [%]
2,3,7,8-TCDF	96	6
1,2,3,7,8-PeCDF	94	8
2,3,4,7,8-PeCDF	103	5
1,2,3,4,7,8-HxCDF	92	4
1,2,3,6,7,8-HxCDF	98	4
2,3,4,6,7,8-HxCDF	99	4
1,2,3,7,8,9-HxCDF	111	1
1,2,3,4,6,7,8-HpCDF	99	2
1,2,3,4,7,8,9-HpCDF	112	4
1,2,3,4,6,7,8,9-OCDF	112	5
2,3,7,8-TCDD	90	9
1,2,3,7,8-PeCDD	94	9
1,2,3,4,7,8-HxCDD	110	5
1,2,3,6,7,8-HxCDD	91	8
1,2,3,7,8,9-HxCDD	112	9
1,2,3,4,6,7,8-HpCDD	103	4
1,2,3,4,6,7,8,9-OCDD	105	3

Table 4: PCB recoveries

PCB 13C Recoveries [%]	[%]	RSD [%]
PCB-#28	95	6
PCB-#52	93	6
PCB-#101	93	16
PCB-#153	85	24
PCB-#138	101	2
PCB-#180	92	13
PCB-#81	105	11
PCB-#77	110	10
PCB-#126	105	10
PCB-#169	109	10
PCB-#123	91	5
PCB-#118	89	5
PCB-#114	92	4
PCB-#105	91	4
PCB-#167	96	1
PCB-#156	93	4
PCB-#157	96	4
PCB-#189	92	5