Quality Control Certificate

Product: **Alumina Column**

Product No.: 15433

Lot No.: 717977

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:	0,15	pg/column
		(crit: < 0,7	pg/column)
	dl-PCB-TEQ:	0,0453	pg/column
		(crit: < 0,05	pg/column)
	Sum Total PCB:	11,9	pg/column
		(crit: < 300	pg/column)

Results Recoveries:	PCDD/F	86	to	111	%	(crit:	70	to	120	%)
	PCB	83	to	112	%	(crit:	70	to	120	%)

This is to certify that the Alumina Column, Lot 717977, passed the required test specifications and is released for sale.

date: 04.05.2023 sign.: T. Kehmeier

The company LCTech GmbH is certified according to ISO 9001

LCTech GmbH
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Hazards:	NOT FOR HUMAN OR DRUG USE! The 209 Column is designed and prepared for usage with the Alumina 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 default alumina plus or pure 209 method onto a DEXTech Pure or Plus system. There are 2 fractions, fraction 1 (all 209 PCB) and fraction 2 (PCDD/F). Both fractions are spiked with the corresponding 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
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	0,07
	1,2,3,7,8-PeCDF	<0,045
	2,3,4,7,8-PeCDF	<dl
	1,2,3,4,7,8-HxCDF	0,036
	1,2,3,6,7,8-HxCDF	<0,018
	2,3,4,6,7,8-HxCDF	<dl
	1,2,3,7,8,9-HxCDF	0,05
	1,2,3,4,6,7,8-HpCDF	<0,063
	1,2,3,4,7,8,9-HpCDF	0,074
	1,2,3,4,6,7,8,9-OCDF	0,06
	2,3,7,8-TCDD	<0,036
	1,2,3,7,8-PeCDD	0,09
	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	0,038
	1,2,3,4,6,7,8-HpCDD	<0,09
	1,2,3,4,6,7,8,9-OCDD	0,23

PCDD/F TEQ (2005)	[pg/column]
lower bound	0,14
upper bound	0,15

Table 2: PCB blank

sample amount [pg/sample]		[pg/column]
	PCB-#28	5,9
	PCB-#52	2,52
	PCB-#101	0,99
	PCB-#153	0,84
	PCB-#138	0,69
	PCB-#180	0,913
	PCB-#81	<dl
	PCB-#77	<dl
	PCB-#126	<dl
	PCB-#169	<dl
	PCB-#123	0,57
	PCB-#118	0,94
	PCB-#114	0,583
	PCB-#105	0,93
	PCB-#167	0,32
	PCB-#156	0,401
	PCB-#157	0,38
	PCB-#189	1,408

PCB-TEQ	[pg/column]
lower bound	0,0453
upper bound	0,0453
Sum DIN	11,9

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Table 3: PCDD/F recoveries

PCDD/F 13C Recoveries [%]	[%]	RSD [%]
2,3,7,8-TCDF	97	6
1,2,3,7,8-PeCDF	93	4
2,3,4,7,8-PeCDF	94	18
1,2,3,4,7,8-HxCDF	86	10
1,2,3,6,7,8-HxCDF	97	16
2,3,4,6,7,8-HxCDF	99	9
1,2,3,7,8,9-HxCDF	91	16
1,2,3,4,6,7,8-HpCDF	111	5
1,2,3,4,7,8,9-HpCDF	104	4
1,2,3,4,6,7,8,9-OCDF	102	4
2,3,7,8-TCDD	101	6
1,2,3,7,8-PeCDD	105	8
1,2,3,4,7,8-HxCDD	100	10
1,2,3,6,7,8-HxCDD	90	8
1,2,3,7,8,9-HxCDD	105	7
1,2,3,4,6,7,8-HpCDD	106	3
1,2,3,4,6,7,8,9-OCDD	99	3

Table 4: PCB recoveries

PCB 13C Recoveries [%]	[%]	RSD [%]
PCB-#28	102	9
PCB-#52	83	46
PCB-#101	103	2
PCB-#153	100	3
PCB-#138	101	2
PCB-#180	98	1
PCB-#81	110	0
PCB-#77	112	0
PCB-#126	112	0
PCB-#169	108	0
PCB-#123	94	5
PCB-#118	92	4
PCB-#114	90	5
PCB-#105	93	5
PCB-#167	103	1
PCB-#156	96	6
PCB-#157	98	6
PCB-#189	101	2

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