Quality Control Certificate

Product:	**Carbon Column**
Product No.:	15242
Lot No.:	**718147**

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

Description: The Carbon 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:	0,11	pg/column
	(crit: < 0,7	pg/column)
dl-PCB-TEQ:	0,0071	pg/column
	(crit: < 0,05	pg/column)
Sum Total PCB:	12,3	pg/column
	(crit: < 300	pg/column)

Results Recoveries:

PCDD/F	82	to	119	%	(crit:	70	to	120	%)
PCB	70	to	94	%	(crit:	70	to	120	%)

This is to certify that the Carbon Column, Lot 718147, passed the required test specifications and is released for sale.

date: 03.04.2023   sign.: _T. Kehemeir_

The company LCTech GmbH is certified according to ISO 9001

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

Results:

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

Blanks: n=   7

Table 1: PCDD/F blank

	[pg/column]
2,3,7,8-TCDF	0,06
1,2,3,7,8-PeCDF	<0,045
2,3,4,7,8-PeCDF	<0,081
1,2,3,4,7,8-HxCDF	<0,027
1,2,3,6,7,8-HxCDF	0,027
2,3,4,6,7,8-HxCDF	0,05
1,2,3,7,8,9-HxCDF	<0,045
1,2,3,4,6,7,8-HpCDF	0,19
1,2,3,4,7,8,9-HpCDF	0,028
1,2,3,4,6,7,8,9-OCDF	0,06
2,3,7,8-TCDD	<0,036
1,2,3,7,8-PeCDD	<0,054
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	<0,027
1,2,3,4,6,7,8-HpCDD	0,14
1,2,3,4,6,7,8,9-OCDD	2,77

Table 2: PCB blank

	[pg/column]
PCB-#28	3,84
PCB-#52	2,03
PCB-#101	1,45
PCB-#153	1,88
PCB-#138	2,07
PCB-#180	1,044
PCB-#81	0,04
PCB-#77	<0,18
PCB-#126	0,0565
PCB-#169	<0,045
PCB-#123	0,3
PCB-#118	0,95
PCB-#114	0,618
PCB-#105	0,61
PCB-#167	0,366
PCB-#156	0,959
PCB-#157	0,5
PCB-#189	0,874

PCDD/F TEQ (2005)	[pg/column]
lower bound	0,11
upper bound	0,11

PCB-TEQ	[pg/column]
lower bound	0,0071
upper bound	0,0071
Sum DIN	12,3

Table 3: PCDD/F recoveries

		[%]	RSD [%]
PCDD/F 13C Recoveries [%]	2,3,7,8-TCDF	100	4
	1,2,3,7,8-PeCDF	93	3
	2,3,4,7,8-PeCDF	99	4
	1,2,3,4,7,8-HxCDF	91	3
	1,2,3,6,7,8-HxCDF	101	3
	2,3,4,6,7,8-HxCDF	95	4
	1,2,3,7,8,9-HxCDF	98	4
	1,2,3,4,6,7,8-HpCDF	119	3
	1,2,3,4,7,8,9-HpCDF	119	8
	1,2,3,4,6,7,8,9-OCDF	107	6
	2,3,7,8-TCDD	95	4
	1,2,3,7,8-PeCDD	98	5
	1,2,3,4,7,8-HxCDD	98	3
	1,2,3,6,7,8-HxCDD	82	3
	1,2,3,7,8,9-HxCDD	97	3
	1,2,3,4,6,7,8-HpCDD	114	6
	1,2,3,4,6,7,8,9-OCDD	94	8

Table 4: PCB recoveries

		[%]	RSD [%]
PCB 13C Recoveries [%]	PCB-#28	80	2
	PCB-#52	82	3
	PCB-#101	94	1
	PCB-#153	90	2
	PCB-#138	91	1
	PCB-#180	93	2
	PCB-#81	90	3
	PCB-#77	94	4
	PCB-#126	92	3
	PCB-#169	89	3
	PCB-#123	84	2
	PCB-#118	76	2
	PCB-#114	92	2
	PCB-#105	87	2
	PCB-#167	70	5
	PCB-#156	83	2
	PCB-#157	79	2
	PCB-#189	81	2