![LCTech Logo - SAMPLE PREPARATION & ANALYSIS]

Quality Control Certificate

Product: **Carbon Column Pos.4**

Product No.: **14090**

Lot No.: **713905**

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

Description: The carbon column is part of a 4-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-up on a DEXTech Plus system, spiked with recovery standard, evaporated via DEva and has been quantified with a HRGC/HRMS with a resolution of R > 10000.

Results Blank Value:	PCDD/F-TEQ:	0,08	pg/column
		(crit: <	0,7	pg/column
	dl-PCB-TEQ:	n/a	pg/column
		(crit: <	0,05	pg/column
	Sum Indikator PCB:	n/a	pg/column
		(crit: <	100	pg/column

| **Results Recoveries:** | PCDD/F | 83 | to | 108 | % | (crit: 70 to 120) |
| | PCB | n/a | to | 0 | % | (crit: 70 to 120) |

This is to certify that carbon column pos. 4, Lot 713905, passed the required test specifications and is released for sale.

date: 10.12.2020   sign.: _T. Kehemeir_

The company LCTech GmbH is certified according to ISO 9001:2015

[DEKRA Certification]

Hazards:	NOT FOR HUMAN OR DRUG USE!
	The carbon column is designed and prepared for usage with the alumina/florisil column and universal/standard & smart 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: Blank values 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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DEKRA.
Certification

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Results:

Lockmass check:

No significant disturbances, or indicators for contaminations are detected.

Blanks:

Table 1: PCDD/F blank (n=8)

Congeneres:	[pg/column]:
2,3,7,8-TCDF	0,04
1,2,3,7,8-PeCDF	0,09
2,3,4,7,8-PeCDF	<0,081
1,2,3,4,7,8-HxCDF	<0,027
1,2,3,6,7,8-HxCDF	<0,018
2,3,4,6,7,8-HxCDF	<dl
1,2,3,7,8,9-HxCDF	<dl
1,2,3,4,6,7,8-HpCDF	<dl
1,2,3,4,7,8,9-HpCDF	0,018
OCDF	20,68
2,3,7,8-TCDD	<dl
1,2,3,7,8-PeCDD	<0,054
1,2,3,4,7,8-HxCDD	<dl
1,2,3,6,7,8-HxCDD	<dl
1,2,3,7,8,9-HxCDD	<dl
1,2,3,4,6,7,8-HpCDD	<dl
OCDD	0,44

TEQ (WHO 2005)	
lower bound	0,08
upper bound	0,1

Table 2: PCB blank (n=8)

Congeneres:	[pg/column]:
PCB 28	
PCB 52	
PCB 77	
PCB 81	
PCB 101	
PCB 123	
PCB 118	
PCB 114	
PCB 105	
PCB 126	
PCB 153	
PCB 138	
PCB 167	
PCB 156	
PCB 157	
PCB 169	
PCB 180	
PCB 189	

TEQ (WHO 2005)	
lower bound	
upper bound	

Sum DIN PCB	

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Results:

13C-Recoveries

Table 3: PCDD/F 13C-recoveries (n=8)   *Table 4: PCB 13C-recoveries (n=8)*

Congeneres:	13C rec [%]
2,3,7,8-TCDF	94
1,2,3,7,8-PeCDF	98
2,3,4,7,8-PeCDF	90
1,2,3,4,7,8-HxCDF	84
1,2,3,6,7,8-HxCDF	83
2,3,4,6,7,8-HxCDF	84
1,2,3,7,8,9-HxCDF	86
1,2,3,4,6,7,8-HpCDF	108
1,2,3,4,7,8,9-HpCDF	104
OCDF	103
2,3,7,8-TCDD	99
1,2,3,7,8-PeCDD	93
1,2,3,4,7,8-HxCDD	85
1,2,3,6,7,8-HxCDD	86
1,2,3,7,8,9-HxCDD	89
1,2,3,4,6,7,8-HpCDD	106
OCDD	92

Congeneres:	13C rec [%]
PCB 28	
PCB 52	
PCB 77	
PCB 81	
PCB 101	
PCB 123	
PCB 118	
PCB 114	
PCB 105	
PCB 126	
PCB 153	
PCB 138	
PCB 167	
PCB 156	
PCB 157	
PCB 169	
PCB 180	
PCB 189	

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