

## Quality Control Certificate

Product: **Carbon Column**  
 Product No.: 15242  
 Lot No.: **717945**

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:	0,25	pg/column
		(crit: <	0,7 pg/column)
	dl-PCB-TEQ:	0,0042	pg/column
	(crit: <	0,05 pg/column)	
	Sum Total PCB:	22,4	pg/column
	(crit: <	300 pg/column)	

Results Recoveries:	PCDD/F	80	to	106	%	(crit: 45	to	130	%)
	PCB	68	to	103	%	(crit: 45	to	130	%)

This is to certify that the Carbon Column, Lot 717945, passed the required test specifications and is released for sale.

date: 13.03.2023 sign.: T. Kehmeier

The company LCTech GmbH is certified according to ISO 9001



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Hazards:	<p>NOT FOR HUMAN OR DRUG USE!</p> <p>The Carbon Column is designed and prepared for usage with the Alumina/Florisil Column and Universal/standard &amp; 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.</p>
Quality Control:	<p>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.</p>
Quality Management:	<p>This product was produced using a Quality Management System registered to the ISO 9001:2015 (DEKRA)</p>
Documentation / Data Attached:	<p>table 1 &amp; 2: blankvalues of PCDD/F and PCB table 3 &amp; 4: 13C-Recoveries of PCDD/F and PCB</p>
Analytics	<p>All the Columns (n&gt;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 &gt; 10000. The HRGCs are equipped with 60 m DB5 MS Columns. For PCDD/F 5µL are injected via PTV, for PCB 2µL via SSL.</p>
Remarks	<p>n/a</p>

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Results:

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

Blanks: n= 10

Table 1: PCDD/F blank

	[pg/column]
2,3,7,8-TCDF	0,11
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	0,021
2,3,4,6,7,8-HxCDF	0,09
1,2,3,7,8,9-HxCDF	0,06
1,2,3,4,6,7,8-HpCDF	<0,063
1,2,3,4,7,8,9-HpCDF	0,044
1,2,3,4,6,7,8,9-OCDF	<0,054
2,3,7,8-TCDD	0,06
1,2,3,7,8-PeCDD	0,12
1,2,3,4,7,8-HxCDD	0,06
1,2,3,6,7,8-HxCDD	0,11
1,2,3,7,8,9-HxCDD	0,046
1,2,3,4,6,7,8-HpCDD	0,14
1,2,3,4,6,7,8,9-OCDD	0,99

Table 2: PCB blank

	[pg/column]
PCB-#28	4,22
PCB-#52	3,85
PCB-#101	3,87
PCB-#153	6,76
PCB-#138	2,09
PCB-#180	1,61
PCB-#81	0,07
PCB-#77	<0,18
PCB-#126	0,0292
PCB-#169	<0,045
PCB-#123	0,5
PCB-#118	1,92
PCB-#114	0,604
PCB-#105	0,72
PCB-#167	0,249
PCB-#156	0,494
PCB-#157	0,53
PCB-#189	0,456

PCDD/F TEQ (2005)	[pg/column]
lower bound	0,25
upper bound	0,25

PCB-TEQ	[pg/column]
lower bound	0,0042
upper bound	0,0042
Sum DIN	22,4

Table 3: PCDD/F recoveries

	[%]	RSD [%]	
PCDD/F 13C Recoveries [%]	2,3,7,8-TCDF	96	2
	1,2,3,7,8-PeCDF	96	9
	2,3,4,7,8-PeCDF	92	7
	1,2,3,4,7,8-HxCDF	90	13
	1,2,3,6,7,8-HxCDF	100	13
	2,3,4,6,7,8-HxCDF	90	12
	1,2,3,7,8,9-HxCDF	96	11
	1,2,3,4,6,7,8-HpCDF	106	8
	1,2,3,4,7,8,9-HpCDF	105	7
	1,2,3,4,6,7,8,9-OCDF	103	7
	2,3,7,8-TCDD	90	3
	1,2,3,7,8-PeCDD	92	9
	1,2,3,4,7,8-HxCDD	103	10
	1,2,3,6,7,8-HxCDD	80	13
	1,2,3,7,8,9-HxCDD	100	12
	1,2,3,4,6,7,8-HpCDD	102	7
	1,2,3,4,6,7,8,9-OCDD	91	5

Table 4: PCB recoveries

	[%]	RSD [%]	
PCB 13C Recoveries [%]	PCB-#28	103	9
	PCB-#52	103	10
	PCB-#101	94	14
	PCB-#153	86	22
	PCB-#138	98	7
	PCB-#180	89	11
	PCB-#81	88	4
	PCB-#77	103	7
	PCB-#126	93	5
	PCB-#169	95	9
	PCB-#123	76	8
	PCB-#118	68	11
	PCB-#114	79	5
	PCB-#105	73	9
	PCB-#167	68	12
	PCB-#156	77	7
	PCB-#157	76	10
	PCB-#189	69	11