

## Quality Control Certificate

Product: **EVOLUTION Alox Column**  
 Product No.: 20087  
 Lot No.: **718052**

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

Description: The EVOLUTION 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:	0,37	pg/column
		(crit: <	0,7 pg/column)
	dl-PCB-TEQ:	0,045	pg/column
		(crit: <	0,05 pg/column)
	Sum Total PCB:	36,4	pg/column
		(crit: <	300 pg/column)

Results Recoveries:	PCDD/F	72	to	102	%	(crit: 45	to	130	%)
	PCB	70	to	127	%	(crit: 45	to	130	%)

This is to certify that the EVOLUTION Alox Column, Lot 718052, passed the required test specifications and is released for sale.

date: 15.02.2023 sign.: T. Keshmeir

The company LCTech GmbH is certified according to ISO 9001



## QC-Certificate - 20087 - 718052

Hazards:	<p>NOT FOR HUMAN OR DRUG USE!</p> <p>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.</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. There is no fraction 1 (PCB) . Fraction 2 (PCDD/F) is 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>

QC-Certificate - 20087 - 718052

Results:

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

Blanks: n= 6

Table 1: PCDD/F blank

	[pg/column]
2,3,7,8-TCDF	0,07
1,2,3,7,8-PeCDF	0,08
2,3,4,7,8-PeCDF	0,1
1,2,3,4,7,8-HxCDF	0,035
1,2,3,6,7,8-HxCDF	0,034
2,3,4,6,7,8-HxCDF	0,09
1,2,3,7,8,9-HxCDF	0,08
1,2,3,4,6,7,8-HpCDF	0,1
1,2,3,4,7,8,9-HpCDF	0,166
1,2,3,4,6,7,8,9-OCDF	5,18
2,3,7,8-TCDD	0,04
1,2,3,7,8-PeCDD	0,22
1,2,3,4,7,8-HxCDD	0,061
1,2,3,6,7,8-HxCDD	0,14
1,2,3,7,8,9-HxCDD	0,151
1,2,3,4,6,7,8-HpCDD	0,3
1,2,3,4,6,7,8,9-OCDD	1,19

Table 2: PCB blank

	[pg/column]
PCB-#28	13,11
PCB-#52	10,11
PCB-#101	3,55
PCB-#153	5,48
PCB-#138	2,7
PCB-#180	1,465
PCB-#81	<dl
PCB-#77	<dl
PCB-#126	<dl
PCB-#169	<dl
PCB-#123	0,26
PCB-#118	1,29
PCB-#114	0,289
PCB-#105	0,46
PCB-#167	0,504
PCB-#156	0,6
PCB-#157	0,23
PCB-#189	0,678

PCDD/F TEQ (2005)	[pg/column]
lower bound	0,37
upper bound	0,37

PCB-TEQ	[pg/column]
lower bound	0,045
upper bound	0,045
Sum DIN	36,4

Table 3: PCDD/F recoveries

	[%]	RSD [%]	
PCDD/F 13C Recoveries [%]	2,3,7,8-TCDF	92	9
	1,2,3,7,8-PeCDF	89	11
	2,3,4,7,8-PeCDF	84	10
	1,2,3,4,7,8-HxCDF	79	12
	1,2,3,6,7,8-HxCDF	87	9
	2,3,4,6,7,8-HxCDF	86	11
	1,2,3,7,8,9-HxCDF	86	18
	1,2,3,4,6,7,8-HpCDF	102	8
	1,2,3,4,7,8,9-HpCDF	96	9
	1,2,3,4,6,7,8,9-OCDF	92	22
	2,3,7,8-TCDD	87	7
	1,2,3,7,8-PeCDD	86	13
	1,2,3,4,7,8-HxCDD	82	14
	1,2,3,6,7,8-HxCDD	72	11
	1,2,3,7,8,9-HxCDD	90	13
	1,2,3,4,6,7,8-HpCDD	97	6
	1,2,3,4,6,7,8,9-OCDD	89	19

Table 4: PCB recoveries

	[%]	RSD [%]	
PCB 13C Recoveries [%]	PCB-#28	101	7
	PCB-#52	87	3
	PCB-#101	110	4
	PCB-#153	127	6
	PCB-#138	114	4
	PCB-#180	91	11
	PCB-#81	74	0
	PCB-#77	83	0
	PCB-#126	70	0
	PCB-#169	91	0
	PCB-#123	104	6
	PCB-#118	109	5
	PCB-#114	71	16
	PCB-#105	87	10
	PCB-#167	104	4
	PCB-#156	78	18
	PCB-#157	94	6
	PCB-#189	86	21