

## Quality Control Certificate

Product: **EVOLUTION Universal Column**  
 Product No.: 20085  
 Lot No.: **718547**

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

Description: The EVOLUTION Universal Column is part of a 3- or 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 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:	0,05	pg/column
		(crit: <	0,7 pg/column)
	dl-PCB-TEQ:	0,0014	pg/column
		(crit: <	0,05 pg/column)
	Sum Total PCB:	6,3	pg/column
		(crit: <	300 pg/column)

Results Recoveries:	PCDD/F	80	to	106	%	(crit: 70	to	120	%)
	PCB	79	to	95	%	(crit: 70	to	120	%)

This is to certify that the EVOLUTION Universal Column, Lot 718547, passed the required test specifications and is released for sale.

date: 28.07.2023 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 EVOLUTION Universal Column is designed and prepared for usage with the Alumina/Florisil Column and Carbon 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>This is to certify that the EVOLUTION Universal Column, Lot , passed the required test specifications and is released for sale.</p>
Remarks	<p>Our suppliers maintain the highest standard of quality, however due to the high temperature necessary for several steps in the production, some small charred particles may be visible within a batch of silica or filters without any effect on the clean-up.</p>



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Results:

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

Blanks: n= 8

Table 1: PCDD/F blank

	[pg/column]
2,3,7,8-TCDF	<dl
1,2,3,7,8-PeCDF	<dl
2,3,4,7,8-PeCDF	<dl
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
1,2,3,4,6,7,8,9-OCDF	<0,054
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	<0,108
1,2,3,7,8,9-HxCDD	<dl
1,2,3,4,6,7,8-HpCDD	<0,09
1,2,3,4,6,7,8,9-OCDD	0,17

Table 2: PCB blank

	[pg/column]
PCB-#28	1,65
PCB-#52	1,37
PCB-#101	0,97
PCB-#153	0,89
PCB-#138	0,61
PCB-#180	0,775
PCB-#81	0,04
PCB-#77	0,05
PCB-#126	0,0131
PCB-#169	<dl
PCB-#123	0,23
PCB-#118	0,73
PCB-#114	0,387
PCB-#105	0,52
PCB-#167	0,361
PCB-#156	0,368
PCB-#157	0,3
PCB-#189	1,157

PCDD/F TEQ (2005)	[pg/column]
lower bound	0,03
upper bound	0,05

PCB-TEQ	[pg/column]
lower bound	0,0014
upper bound	0,0017
Sum DIN	6,3

Table 3: PCDD/F recoveries

	[%]	RSD [%]	
PCDD/F 13C Recoveries [%]	2,3,7,8-TCDF	89	6
	1,2,3,7,8-PeCDF	80	8
	2,3,4,7,8-PeCDF	83	7
	1,2,3,4,7,8-HxCDF	93	10
	1,2,3,6,7,8-HxCDF	101	12
	2,3,4,6,7,8-HxCDF	100	6
	1,2,3,7,8,9-HxCDF	96	14
	1,2,3,4,6,7,8-HpCDF	104	3
	1,2,3,4,7,8,9-HpCDF	95	6
	1,2,3,4,6,7,8,9-OCDF	98	8
	2,3,7,8-TCDD	83	5
	1,2,3,7,8-PeCDD	84	10
	1,2,3,4,7,8-HxCDD	106	7
	1,2,3,6,7,8-HxCDD	89	7
	1,2,3,7,8,9-HxCDD	105	8
	1,2,3,4,6,7,8-HpCDD	94	4
	1,2,3,4,6,7,8,9-OCDD	90	5

Table 4: PCB recoveries

	[%]	RSD [%]	
PCB 13C Recoveries [%]	PCB-#28	90	5
	PCB-#52	89	8
	PCB-#101	95	2
	PCB-#153	94	2
	PCB-#138	94	2
	PCB-#180	92	2
	PCB-#81	86	7
	PCB-#77	93	10
	PCB-#126	85	21
	PCB-#169	81	27
	PCB-#123	82	5
	PCB-#118	79	5
	PCB-#114	84	2
	PCB-#105	81	8
	PCB-#167	80	11
	PCB-#156	81	6
	PCB-#157	81	7
	PCB-#189	82	5