

Quality Control Certificate

Product: **EVOLUTION Universal Column**
Product No.: 20085
Lot No.: **719784**

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:	0,59	pg/column
		(crit: <	0,7 pg/column)
	dl-PCB-TEQ:	0,0295	pg/column
		(crit: <	0,05 pg/column)
	Sum Total PCB:	59	pg/column
		(crit: <	300 pg/column)

Results Recoveries:	PCDD/F	82	to	103	%	(crit: 70	to	120	%)
	PCB	79	to	101	%	(crit: 70	to	120	%)

This is to certify that the EVOLUTION Universal Column, Lot 719784, passed the required test specifications and is released for sale.

date: 15.02.2024 sign.: T. Keshmeir

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 & 2: blankvalues of PCDD/F and PCB table 3 & 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= 9

Table 1: PCDD/F blank

	[pg/column]
2,3,7,8-TCDF	0,06
1,2,3,7,8-PeCDF	0,21
2,3,4,7,8-PeCDF	0,28
1,2,3,4,7,8-HxCDF	0,288
1,2,3,6,7,8-HxCDF	0,223
2,3,4,6,7,8-HxCDF	0,2
1,2,3,7,8,9-HxCDF	0,27
1,2,3,4,6,7,8-HpCDF	0,4
1,2,3,4,7,8,9-HpCDF	0,272
1,2,3,4,6,7,8,9-OCDF	0,46
2,3,7,8-TCDD	0,09
1,2,3,7,8-PeCDD	0,22
1,2,3,4,7,8-HxCDD	0,19
1,2,3,6,7,8-HxCDD	0,33
1,2,3,7,8,9-HxCDD	0,194
1,2,3,4,6,7,8-HpCDD	0,31
1,2,3,4,6,7,8,9-OCDD	0,83

Table 2: PCB blank

	[pg/column]
PCB-#28	11,63
PCB-#52	12,38
PCB-#101	7,57
PCB-#153	12,99
PCB-#138	9,56
PCB-#180	4,916
PCB-#81	0,12
PCB-#77	1,016
PCB-#126	0,235
PCB-#169	0,182
PCB-#123	1,05
PCB-#118	3,72
PCB-#114	0,777
PCB-#105	1,78
PCB-#167	1,33
PCB-#156	1,789
PCB-#157	0,82
PCB-#189	2,293

PCDD/F TEQ (2005)	[pg/column]
lower bound	0,59
upper bound	0,59

PCB-TEQ	[pg/column]
lower bound	0,0295
upper bound	0,0295
Sum DIN	59

Table 3: PCDD/F recoveries

	[%]	RSD [%]	
PCDD/F 13C Recoveries [%]	2,3,7,8-TCDF	95	6
	1,2,3,7,8-PeCDF	87	8
	2,3,4,7,8-PeCDF	92	10
	1,2,3,4,7,8-HxCDF	93	31
	1,2,3,6,7,8-HxCDF	96	34
	2,3,4,6,7,8-HxCDF	97	25
	1,2,3,7,8,9-HxCDF	102	28
	1,2,3,4,6,7,8-HpCDF	89	10
	1,2,3,4,7,8,9-HpCDF	95	5
	1,2,3,4,6,7,8,9-OCDF	89	6
	2,3,7,8-TCDD	83	7
	1,2,3,7,8-PeCDD	88	15
	1,2,3,4,7,8-HxCDD	103	19
	1,2,3,6,7,8-HxCDD	83	22
	1,2,3,7,8,9-HxCDD	99	23
	1,2,3,4,6,7,8-HpCDD	87	6
	1,2,3,4,6,7,8,9-OCDD	82	7

Table 4: PCB recoveries

	[%]	RSD [%]	
PCB 13C Recoveries [%]	PCB-#28	95	7
	PCB-#52	101	14
	PCB-#101	95	5
	PCB-#153	96	5
	PCB-#138	94	6
	PCB-#180	90	10
	PCB-#81	80	5
	PCB-#77	82	6
	PCB-#126	83	6
	PCB-#169	90	7
	PCB-#123	83	14
	PCB-#118	82	14
	PCB-#114	85	14
	PCB-#105	79	9
	PCB-#167	85	4
	PCB-#156	82	13
	PCB-#157	81	13
	PCB-#189	81	8