# Quality Control Certificate

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|---|---|
| Product: | **209PCB** |
| Product No.: | 20325 |
| **Lot No.:** | **720554** |

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

Description: The 209PCB 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 all 209 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: | 0,01 | pg/column | (crit: 0,7 pg/column) |
| | dl-PCB-TEQ: | 0,044 | pg/column | (crit: 0,05 pg/column) |
| | Sum total PCB: | 26,2 | pg/column | (crit: 300 pg/column) |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Results Recoveries: | PCDD/F | 73 | to | 110 | % | (crit: | 45 | to | 130 | %) |
| | PCB | 57 | to | 125 | % | (crit: | 45 | to | 130 | %) |

This is to certify that the 209PCB, Lot 20325, passed the required test specifications and is released for sale.

date: 04.07.2024 sign.: M. Brachs

The company LCTech GmbH is certified according to ISO 9001

**LCTech GmbH**
Daimlerstrasse 4, 84419 Obertaufkirchen
Germany

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|---|---|
| Hazards: | NOT FOR HUMAN OR DRUG USE!<br><br>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. |
| 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: blankvalues of PCDD/F and PCB<br>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 default alumina plus or pure 209 method onto a DEXTech Pure or Plus system. There are 2 fractions, fraction 1 (all 209 PCB) and fraction 2 (PCDD/F). Both fractions are spiked with the corresponding 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. |
| Remarks | 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 Florisil or filters without any effect on the clean-up. |

**Results:**

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

*Table 1: PCB recoveries*

| PCB 13C Recoveries [%] | [%] | RSD [%] |
|---|---|---|
| PCB#1L | 91 | 9 |
| PCB#3L | 97 | 5 |
| PCB#4L | 100 | 13 |
| PCB#8L | 101 | 2 |
| PCB#15L | 102 | 5 |
| PCB#19L | 99 | 7 |
| PCB#28L | 125 | 5 |
| PCB#54L | 104 | 7 |
| PCB#52L | 124 | 4 |
| PCB#70L | 91 | 7 |
| PCB#81L | 109 | 2 |
| PCB#77L | 76 | 2 |
| PCB#104L | 87 | 4 |
| PCB#95LL | 98 | 11 |
| PCB#101L | 87 | 3 |
| PCB#123L | 94 | 4 |
| PCB#118L | 95 | 4 |
| PCB#114L | 95 | 4 |
| PCB#105L | 100 | 6 |
| PCB#126L | 87 | 5 |
| PCB#155L | 91 | 9 |
| PCB#153L | 97 | 7 |
| PCB#138L | 100 | 6 |
| PCB#167L | 101 | 2 |
| PCB#156L | 102 | 4 |
| PCB#157L | 99 | 3 |
| PCB#169L | 125 | 3 |
| PCB#180L | 104 | 4 |
| PCB#170L | 124 | 5 |
| PCB#188L | 91 | 4 |
| PCB#189L | 109 | 3 |
| PCB#202L | 76 | 5 |
| PCB#205L | 87 | 2 |
| PCB#208L | 98 | 4 |
| PCB#209L | 87 | 3 |

*Table 2: PCB blank*

| native amount | [pg/column] |
|---|---|
| PCB#1 | <dl |
| PCB#3 | <dl |
| PCB#4 | <dl |
| PCB#8/5 | <dl |
| PCB#15 | <dl |
| PCB#19 | <dl |
| PCB#28 | <dl |
| PCB#54 | <dl |
| PCB#52/69 | <dl |
| PCB#70 | <1,794 |
| PCB#81 | <dl |
| PCB#77 | <0,67 |
| PCB#104 | <dl |
| PCB#102/93/98/95 | <dl |
| PCB#101 | <dl |
| PCB#123 | <dl |
| PCB#118 | <dl |
| PCB#114 | <dl |
| PCB#105 | <dl |
| PCB#126 | <0,577 |
| PCB#155 | <dl |
| PCB#153 | <dl |
| PCB#138 | <dl |
| PCB#167 | <0,285 |
| PCB#156 | <dl |
| PCB#157 | <dl |
| PCB#169 | <dl |
| PCB#180 | <dl |
| PCB#170 | <dl |
| PCB#188 | <dl |
| PCB#189 | <dl |
| PCB#202 | <dl |
| PCB#205 | <dl |
| PCB#208 | <dl |
| PCB#209 | <dl |

Blanks: n = 6

[pg/column]

| PCB-TEQ | |
|---|---|
| lower bound | 0,044 |
| upper bound | 0,044 |
| Sum DIN | 1,4 |

[pg/column]

| Grade of chlorination | |
|---|---|
| sum mono | 0,1855 |
| sum di | 13,5218 |
| sum tri | 7,2397 |
| sum tetra | 2,286 |
| sum penta | 1,2562 |
| sum hexa | 1,0205 |
| sum hepta | 0,4222 |
| sum octa | 0,2217 |
| sum nona | 0,0123 |
| sum deca | 0,0172 |
| sum total | 26,183 |

**LCTech GmbH**
Daimlerstrasse 4, 84419 Obertaufkirchen, Germany,
Tel +49 8082 2717 - 0, info@lctech.de, www.lctech.de

Blanks: n = 6

*Table 3: PCDD/F recoveries*

| PCDD/F 13C Recoveries [%] | | [%] |
|---|---|---|
| | 2,3,7,8-TCDF | 77 |
| | 1,2,3,7,8-PeCDF | 75 |
| | 2,3,4,7,8-PeCDF | 77 |
| | 1,2,3,4,7,8-HxCDF | 88 |
| | 1,2,3,6,7,8-HxCDF | 93 |
| | 2,3,4,6,7,8-HxCDF | 103 |
| | 1,2,3,7,8,9-HxCDF | 108 |
| | 1,2,3,4,6,7,8-HpCDF | 104 |
| | 1,2,3,4,7,8,9-HpCDF | 87 |
| | 1,2,3,4,6,7,8,9-OCDF | 96 |
| | 2,3,7,8-TCDD | 73 |
| | 1,2,3,7,8-PeCDD | 82 |
| | 1,2,3,4,7,8-HxCDD | 109 |
| | 1,2,3,6,7,8-HxCDD | 93 |
| | 1,2,3,7,8,9-HxCDD | 110 |
| | 1,2,3,4,6,7,8-HpCDD | 94 |
| | 1,2,3,4,6,7,8,9-OCDD | 87 |

*Table4: PCDD/F blank*

| native amount | | [pg/column] |
|---|---|---|
| | 2,3,7,8-TCDF | <dl |
| | 1,2,3,7,8-PeCDF | <0,045 |
| | 2,3,4,7,8-PeCDF | <dl |
| | 1,2,3,4,7,8-HxCDF | 0,041 |
| | 1,2,3,6,7,8-HxCDF | 0,029 |
| | 2,3,4,6,7,8-HxCDF | <0,045 |
| | 1,2,3,7,8,9-HxCDF | <0,045 |
| | 1,2,3,4,6,7,8-HpCDF | 0,26 |
| | 1,2,3,4,7,8,9-HpCDF | <dl |
| | 1,2,3,4,6,7,8,9-OCDF | <0,054 |
| | 2,3,7,8-TCDD | <dl |
| | 1,2,3,7,8-PeCDD | <dl |
| | 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 |
| | 1,2,3,4,6,7,8,9-OCDD | 0,4 |

| PCDD/F TEQ (2005) | [pg/column] |
|---|---|
| lower bound | 0,01 |
| upper bound | 0,06 |

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