



January 17 2007

prCEN/TS 1948-4:2006

CALIBRATION KITS AND SUPPORT SOLUTIONS FOR THE ANALYSIS OF DIOXIN-LIKE (WHO) AND MARKER PCBs

WELLINGTON LABORATORIES has prepared solutions for the analysis of the dioxin-like PCBs (WHO PCBs) and what are termed Marker PCBs in emissions from stationary sources. This is in response to the current, draft version of method prCEN/TS 1948-4.

| <u>Catalogue Number</u> | <u>Description</u> |
|-------------------------|---|
| • P48-W-CVS | WHO PCB HRGC/HRMS Calibration Solutions <i>1 kit; 6 x 500 µl ampoules</i> |
| • P48-M-CVS | Marker PCB HRGC/HRMS Calibration Solutions <i>1 kit; 6 x 500 µl ampoules</i> |
| • P48-W-ES | WHO PCB Extraction Standards <i>1.2 ml ampoule</i> |
| • P48-M-ES | Marker PCB Extraction Standards <i>1.2 ml ampoule</i> |
| • P48-SS | Mass-Labelled PCB Sampling Standards <i>1.2 ml ampoule</i> |
| • P48-RS | Mass-Labelled PCB Recovery Standards <i>1.2 ml ampoule</i> |

The components and concentrations of these products can be found on the following pages. All of these products come with a Certificate of Analysis (C of A) that includes HRGC/HRMS data and, in the case of calibration solutions, RRF summaries.

Please be advised that the method, and possibly the required solutions, may be changed in the final version.

Please contact your local distributor or info@well-labs.com for pricing and delivery.

P48-W-CVS

| Catalogue Number | Product (nonane solution) | Qty/Conc | | | | | |
|------------------|---|-----------------------|--|--|--|--|--|
| P48-W-CVS | P48-W-CVS; prCEN/TS 1948-4:2006 HRGC/HRMS Calibration Solutions for the WHO PCBs | 1 kit (6 ampoules) | | | | | |
| P48-W-CS1 | CS1 | 500 µl | | | | | |
| P48-W-CS2 | CS2 | 500 µl | | | | | |
| P48-W-CS3 | CS3 | 500 µl | | | | | |
| P48-W-CS4 | CS4 | 500 µl | | | | | |
| P48-W-CS5 | CS5 | 500 µl | | | | | |
| P48-W-CS6 | CS6 | 500 µl | | | | | |

| NATIVE WHO PCB CONGENERS | IUPAC | P48-W- | P48-W- | P48-W- | P48-W- | P48-W- | P48-W- |
|--------------------------------------|-------|----------------|----------------|----------------|----------------|----------------|----------------|
| | | CS1 (pg/µl) | CS2 (pg/µl) | CS3 (pg/µl) | CS4 (pg/µl) | CS5 (pg/µl) | CS6 (pg/µl) |
| 3,3',4,4'-Tetrachlorobiphenyl | 77 | 0.1 | 1.0 | 10 | 50 | 200 | 800 |
| 3,4,4',5-Tetrachlorobiphenyl | 81 | 0.1 | 1.0 | 10 | 50 | 200 | 800 |
| 2,3,3',4,4'-Pentachlorobiphenyl | 105 | 0.1 | 1.0 | 10 | 50 | 200 | 800 |
| 2,3,4,4',5-Pentachlorobiphenyl | 114 | 0.1 | 1.0 | 10 | 50 | 200 | 800 |
| 2,3',4,4',5-Pentachlorobiphenyl | 118 | 0.6 | 6.0 | 60 | 300 | 1200 | 4800 |
| 2',3,4,4',5-Pentachlorobiphenyl | 123 | 0.1 | 1.0 | 10 | 50 | 200 | 800 |
| 3,3',4,4',5-Pentachlorobiphenyl | 126 | 0.1 | 1.0 | 10 | 50 | 200 | 800 |
| 2,3,3',4,4',5-Hexachlorobiphenyl | 156 | 0.1 | 1.0 | 10 | 50 | 200 | 800 |
| 2,3,3',4,4',5'-Hexachlorobiphenyl | 157 | 0.1 | 1.0 | 10 | 50 | 200 | 800 |
| 2,3',4,4',5,5'-Hexachlorobiphenyl | 167 | 0.1 | 1.0 | 10 | 50 | 200 | 800 |
| 3,3',4,4',5,5'-Hexachlorobiphenyl | 169 | 0.1 | 1.0 | 10 | 50 | 200 | 800 |
| 2,3,3',4,4',5,5'-Heptachlorobiphenyl | 189 | 0.1 | 1.0 | 10 | 50 | 200 | 800 |

| WHO PCB EXTRACTION SPIKE (P48-W-ES) | | | | | | | |
|---|------|----|----|----|----|----|----|
| 3,3',4,4'-Tetrachloro[¹³ C ₁₂]biphenyl | 77L | 10 | 10 | 10 | 10 | 10 | 10 |
| 3,4,4',5-Tetrachloro[¹³ C ₁₂]biphenyl | 81L | 10 | 10 | 10 | 10 | 10 | 10 |
| 2,3,3',4,4'-Pentachloro[¹³ C ₁₂]biphenyl | 105L | 10 | 10 | 10 | 10 | 10 | 10 |
| 2,3,4,4',5-Pentachloro[¹³ C ₁₂]biphenyl | 114L | 10 | 10 | 10 | 10 | 10 | 10 |
| 2,3',4,4',5-Pentachloro[¹³ C ₁₂]biphenyl | 118L | 10 | 10 | 10 | 10 | 10 | 10 |
| 2',3,4,4',5-Pentachloro[¹³ C ₁₂]biphenyl | 123L | 10 | 10 | 10 | 10 | 10 | 10 |
| 3,3',4,4',5-Pentachloro[¹³ C ₁₂]biphenyl | 126L | 10 | 10 | 10 | 10 | 10 | 10 |
| 2,3,3',4,4',5-Hexachloro[¹³ C ₁₂]biphenyl | 156L | 10 | 10 | 10 | 10 | 10 | 10 |
| 2,3,3',4,4',5'-Hexachloro[¹³ C ₁₂]biphenyl | 157L | 10 | 10 | 10 | 10 | 10 | 10 |
| 2,3',4,4',5,5'-Hexachloro[¹³ C ₁₂]biphenyl | 167L | 10 | 10 | 10 | 10 | 10 | 10 |
| 3,3',4,4',5,5'-Hexachloro[¹³ C ₁₂]biphenyl | 169L | 10 | 10 | 10 | 10 | 10 | 10 |
| 2,3,3',4,4',5,5'-Heptachloro[¹³ C ₁₂]biphenyl | 189L | 10 | 10 | 10 | 10 | 10 | 10 |

| SAMPLING SPIKE (P48-S5) | | | | | | | |
|---|------|----|----|----|----|----|----|
| 2,3,4,4'-Tetrachloro[¹³ C ₁₂]biphenyl | 60L | 10 | 10 | 10 | 10 | 10 | 10 |
| 3,3',4,5,5'-Pentachloro[¹³ C ₁₂]biphenyl | 127L | 10 | 10 | 10 | 10 | 10 | 10 |
| 2,3,3',4,5,5'-Hexachloro[¹³ C ₁₂]biphenyl | 159L | 10 | 10 | 10 | 10 | 10 | 10 |

| RECOVERY SPIKE (P48-R5) | | | | | | | |
|---|------|----|----|----|----|----|----|
| 2,3',4',5-Tetrachloro[¹³ C ₁₂]biphenyl | 70L | 10 | 10 | 10 | 10 | 10 | 10 |
| 2,3,3',5,5'-Pentachloro[¹³ C ₁₂]biphenyl | 111L | 10 | 10 | 10 | 10 | 10 | 10 |
| 2,2',3,3',4,4',5-Heptachloro[¹³ C ₁₂]biphenyl | 170L | 10 | 10 | 10 | 10 | 10 | 10 |



P48-M-CVS

| Catalogue Number | Product (nonane solution) | Qty/Conc | | | | | |
|--|---|-------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| P48-M-CVS | P48-M-CVS; prCENTS 1948-4:2006 HRGC/HRMS Calibration Solutions for the Marker PCBs | 1 kit (6 ampoules) | | | | | |
| P48-M-CS0.1 | CS0.1 | 500 µl | | | | | |
| P48-M-CS1 | CS1 | 500 µl | | | | | |
| P48-M-CS2 | CS2 | 500 µl | | | | | |
| P48-M-CS3 | CS3 | 500 µl | | | | | |
| P48-M-CS4 | CS4 | 500 µl | | | | | |
| P48-M-CS5 | CS5 | 500 µl | | | | | |
| NATIVE MARKER PCB CONGENERS | | | | | | | |
| | <i>IUPAC</i> | P48-M- CS0.1 | P48-M- CS1 | P48-M- CS2 | P48-M- CS3 | P48-M- CS4 | P48-M- CS5 |
| | | (pg/µl) | (pg/µl) | (pg/µl) | (pg/µl) | (pg/µl) | (pg/µl) |
| 2,4,4'-Trichlorobiphenyl | 28 | 0.1 | 1.0 | 10 | 100 | 500 | 5000 |
| 2,2',5,5'-Tetrachlorobiphenyl | 52 | 0.1 | 1.0 | 10 | 100 | 500 | 5000 |
| 2,2',4,5,5'-Pentachlorobiphenyl | 101 | 0.1 | 1.0 | 10 | 100 | 500 | 5000 |
| 2,2',3,4,4',5'-Hexachlorobiphenyl | 138 | 0.1 | 1.0 | 10 | 100 | 500 | 5000 |
| 2,2',4,4',5,5'-Hexachlorobiphenyl | 153 | 0.1 | 1.0 | 10 | 100 | 500 | 5000 |
| 2,2',3,4,4',5,5'-Heptachlorobiphenyl | 180 | 0.1 | 1.0 | 10 | 100 | 500 | 5000 |
| MARKER PCB EXTRACTION SPIKE (P48-M-ES) | | | | | | | |
| 2,4,4'-Trichloro[¹³ C ₁₂]biphenyl | 28L | 100 | 100 | 100 | 100 | 100 | 100 |
| 2,2',5,5'-Tetrachloro[¹³ C ₁₂]biphenyl | 52L | 100 | 100 | 100 | 100 | 100 | 100 |
| 2,2',4,5,5'-Pentachloro[¹³ C ₁₂]biphenyl | 101L | 100 | 100 | 100 | 100 | 100 | 100 |
| 2,2',3,4,4',5'-Hexachloro[¹³ C ₁₂]biphenyl | 138L | 100 | 100 | 100 | 100 | 100 | 100 |
| 2,2',4,4',5,5'-Hexachloro[¹³ C ₁₂]biphenyl | 153L | 100 | 100 | 100 | 100 | 100 | 100 |
| 2,2',3,4,4',5,5'-Heptachloro[¹³ C ₁₂]biphenyl | 180L | 100 | 100 | 100 | 100 | 100 | 100 |
| SAMPLING SPIKE (P48-SS) | | | | | | | |
| 2,3,4,4'-Tetrachloro[¹³ C ₁₂]biphenyl | 60L | 10 | 10 | 10 | 10 | 10 | 10 |
| 3,3',4,5,5'-Pentachloro[¹³ C ₁₂]biphenyl | 127L | 10 | 10 | 10 | 10 | 10 | 10 |
| 2,3,3',4,5,5'-Hexachloro[¹³ C ₁₂]biphenyl | 159L | 10 | 10 | 10 | 10 | 10 | 10 |
| RECOVERY SPIKE (P48-RS) | | | | | | | |
| 2,3',4',5'-Tetrachloro[¹³ C ₁₂]biphenyl | 70L | 10 | 10 | 10 | 10 | 10 | 10 |
| 2,3,3',5,5'-Pentachloro[¹³ C ₁₂]biphenyl | 111L | 10 | 10 | 10 | 10 | 10 | 10 |
| 2,2',3,3',4,4',5'-Heptachloro[¹³ C ₁₂]biphenyl | 170L | 10 | 10 | 10 | 10 | 10 | 10 |



SUPPORT SOLUTIONS FOR prCEN/TS 1948-4:2006

| Catalogue Number | Product (nonane solution) | Qty/Conc |
|------------------|--------------------------------------|----------|
| P48-W-ES | WHO PCB Extraction Standards | 1.2 ml |
| P48-M-ES | Marker PCB Extraction Standards | 1.2 ml |
| P48-SS | Mass-Labelled PCB Sampling Standards | 1.2 ml |
| P48-RS | Mass-Labelled PCB Recovery Standards | 1.2 ml |

| WHO PCB EXTRACTION STANDARDS | <i>IUPAC</i> | P48-W-ES (pg/μl) | P48-M-ES (pg/μl) | P48-SS (pg/μl) | P48-RS (pg/ul) |
|---|--------------|---------------------|---------------------|-------------------|-------------------|
| 3,3',4,4'-Tetrachloro ^[13C₁₂] biphenyl | 77L | 100 | — | — | — |
| 3,4,4',5-Tetrachloro ^[13C₁₂] biphenyl | 81L | 100 | — | — | — |
| 2,3,3',4,4'-Pentachloro ^[13C₁₂] biphenyl | 105L | 100 | — | — | — |
| 2,3,4,4',5-Pentachloro ^[13C₁₂] biphenyl | 114L | 100 | — | — | — |
| 2,3',4,4',5-Pentachloro ^[13C₁₂] biphenyl | 118L | 100 | — | — | — |
| 2',3,4,4',5-Pentachloro ^[13C₁₂] biphenyl | 123L | 100 | — | — | — |
| 3,3',4,4',5-Pentachloro ^[13C₁₂] biphenyl | 126L | 100 | — | — | — |
| 2,3,3',4,4',5-Hexachloro ^[13C₁₂] biphenyl | 156L | 100 | — | — | — |
| 2,3,3',4,4',5'-Hexachloro ^[13C₁₂] biphenyl | 157L | 100 | — | — | — |
| 2,3',4,4',5,5'-Hexachloro ^[13C₁₂] biphenyl | 167L | 100 | — | — | — |
| 3,3',4,4',5,5'-Hexachloro ^[13C₁₂] biphenyl | 169L | 100 | — | — | — |
| 2,3,3',4,4',5,5'-Heptachloro ^[13C₁₂] biphenyl | 189L | 100 | — | — | — |
| MARKER PCB EXTRACTION STANDARDS | | | | | |
| 2,4,4'-Trichloro ^[13C₁₂] biphenyl | 28L | — | 1000 | — | — |
| 2,2',5,5'-Tetrachloro ^[13C₁₂] biphenyl | 52L | — | 1000 | — | — |
| 2,2',4,5,5'-Pentachloro ^[13C₁₂] biphenyl | 101L | — | 1000 | — | — |
| 2,2',3,4,4',5'-Hexachloro ^[13C₁₂] biphenyl | 138L | — | 1000 | — | — |
| 2,2',4,4',5,5'-Hexachloro ^[13C₁₂] biphenyl | 153L | — | 1000 | — | — |
| 2,2',3,4,4',5,5'-Heptachloro ^[13C₁₂] biphenyl | 180L | — | 1000 | — | — |
| MASS-LABELLED PCB SAMPLING STANDARDS | | | | | |
| 2,3,4,4'-Tetrachloro ^[13C₁₂] biphenyl | 60L | — | — | 100 | — |
| 3,3',4,5,5'-Pentachloro ^[13C₁₂] biphenyl | 127L | — | — | 100 | — |
| 2,3,3',4,5,5'-Hexachloro ^[13C₁₂] biphenyl | 159L | — | — | 100 | — |
| MASS-LABELLED PCB RECOVERY STANDARDS | | | | | |
| 2,3',4',5-Tetrachloro ^[13C₁₂] biphenyl | 70L | — | — | — | 100 |
| 2,3,3',5,5'-Pentachloro ^[13C₁₂] biphenyl | 111L | — | — | — | 100 |
| 2,2',3,3',4,4',5-Heptachloro ^[13C₁₂] biphenyl | 170L | — | — | — | 100 |

