

IZVEŠTAJ O ISPITIVANJU¹ br. 75100101

Beograd, 09.12.2025. godine

¹ Izveštaj se ne sme umnožavati bez odobrenja ANAHEM Laboratorije. Kopija ovog izveštaja nije zvanični dokument. Izveštaj važi samo kao celina, sa originalom pečata; Anahem doo Beograd je odgovoran za sve podatke iskazane u izveštaju o ispitivanju osim za one dobijene od korisnika ispitivanja. Anahem doo Beograd se odriče odgovornosti na validnost rezultata za čije iskazivanje su korišćeni podaci dobijeni od korisnika.

1 OPŠTI PODACI O OVLAŠĆENOM PRAVNOM LICU KOJE JE OBAVILO ISPITIVANJE

Naziv: ANAHEM DOO
Adresa: Beograd, ul. Mocartova br. 10
Telefon: (011) 3422 800
Telefaks: (011) 3422 900
E-mail: vazduh@anahem.org
Lice za kontakt: Latinka Slavković Beškoski, Rukovodilac laboratorije za ispitivanje vazduha

2 OPŠTI PODACI O OPERATERU

Naziv: VEOLIA WASTE VINČA OPERATOR DOO
Adresa: Tošin Bunar 272, II sprat, 11070 BEOGRAD (NOVI BEOGRAD)
Telefon: (066) 8809975
Matični broj: 21328723
E-mail: dimitrije.hadzipavlovic@veolia.com
Lice za kontakt: Dimitrije Hadži-Pavlović, Procesni inženjer postrojenja EFW-Vinča

3 PLAN, MESTO I VREME MERENJA

| | |
|-----------------------|--|
| Cilj ispitivanja | Izrada Izveštaja o ispitivanju uzoraka dioksina/furana (PCDD/PCDF) i polihlorovanih bifenila (PCB dioxin-like) sa sistema za kontinualno uzorkovanje proizvođača TCR TECORA. |
| Lokacija ispitivanja | EFW Vinča - postrojenje za energetska iskorišćenje komunalnog otpada |
| Parametri ispitivanja | Dioksini/furani (PCDD/PCDF) i polihlorovani bifenili (PCB dioxin-like) |

4 ZAKONSKA REGULATIVA, PRIMENJENI STANDARDI

- Zakon o zaštiti vazduha ("Sl. glasnik RS", br. 51/2025);
- Uredba o merenjima emisija zagađujućih materija u vazduh iz stacionarnih izvora zagađivanja ("Sl. glasnik RS", br. 5/2016 i 10/2024);
- Uredba o tehničkim i tehnološkim uslovima za projektovanje, izradnju, opremanje i rad postrojenja i vrstama otpada za termički tretman otpada, granične vrednosti emisije i njihovo praćenje („Sl. glasnik RS”, br. 103/2023).

4.1 Opis postupka uzorkovanja i analize

Kontinualno merenje koncentracija navedenih parametara zagađenja podrazumeva postupak uzorkovanja sistemom za kontinualno uzorkovanje proizvođača TCR TECORA (DECS - Dioxin Emission Continuous Sampling) uz praćenje parametara stanja otpadnog gasa pomoću automatizovanog kontrolnog sistema (kontrolne jedinice). Uzorkovanje se obavlja u emiteru (dimnjaku) kotla - insineratora (postrojenja za insineraciju otpada) u skladu sa zahtevima metode EN 1948-1. Uzorci se nakon predviđenog perioda uzorkovanja dalje transportuju na analizu u laboratoriju akreditovanog inostranog ugovarača ALS, Češka.

Napomena: Izveštaj akreditovane laboratorije ALS je sastavni deo ovog Izveštaja i nalazi se u prilogu.

| | |
|--------------------|--|
| Postrojenje | Постројење за инсинерацију отпада |
| Tip | Insineracija otpada |
| Proizvođač | CNIM (LICENCOR) |
| Gorivo | Komunalni otpad |

| Tehnički podaci o emiteru | |
|----------------------------------|---|
| Merno mesto | Emiter (dimnjak) insineratora otpada |
| Visina emitera | 60,5 m |
| Prečnik emitera | 2,35 m |
| Tip emitera | Čelični |
| Položaj | Vertikalni |
| Oblik poprečnog preseka | Kružni |
| GPS koordinate | N 44.77982° E 20.58761° |



Slika br. 1

4.2 Opis tehnološkog procesa postrojenja za energetska iskorišćenje komunalnog otpada EfW Vinča

Tehnološki proces rada EfW postrojenja sastoji se iz više osnovnih tehnoloških celina, operacija i aktivnosti:

- Prijem, skladištenje i priprema otpada za insineraciju,
- Insineracija otpada,
- Prečišćavanje dimnog gasa,
- Tretman šljake,
- Solidifikacija letećeg pepela i čvrstog ostatka od prečišćavanja dimnog gasa,
- Iskorišćenje energije dobijene sagorevanjem otpada.

Za funkcionisanje osnovnih tehnoloških celina, EfW postrojenje je opremljeno sledećim pratećim tehnološkim celinama i sistemima:

- Pogon za proizvodnju demineralizovane vode,
- Sistem za proizvodnju komprimovanog - instrumentalnog i procesnog vazduha,
- Sistem za skladištenje i distribuciju dizel goriva,
- Sistem taložnika za reciklovanje drenažnih tokova iz procesa.

Kotlovsko postrojenje podrazumeva kotao sa pripadajućom opremom i pomoćnim sistemima i uređajima koji omogućavaju normalno funkcionisanje kotla od ulaza otpada do ispuštanja dimnih gasova i ulaza napojne vode do izlaza pregrejane pare. Kotlovsko postrojenje obuhvata:

- Sistem za sagorevanje otpada,
- Sistem za odvođenje i separaciju šljake,
- Sistem napojne kotlovske vode,
- Kotao (parni bubanj i ogrevne površine kotla - isparivači, pregrejači i ekonomajzeri),
- Sistem vazduha za sagorevanje,
- Dimni trakt kotla,

- Sistem pomoćnih, dizel gorionika, za start i zaustavljanje kotla i obezbeđivanje parametara (temperature) insineracije;
- Finalni ekonomajzer, za predgrevanje povratnog kondenzata,
- Ostalu opremu i uređaje.

Kotao je vertikalne konstrukcije sa optimizovanom rekuperacijom energije, sistemom za redukciju azotnih oksida u ložištu i Martinovom pokretnom rešetkom. Rešetka je projektovana za kontinualni rad sa DTM u opsegu od 6.000 kJ/kg do 12.000 kJ/kg i sagorevanje različitih vrsta otpada. Maksimalni kapacitet sagorevanja iznosi 49,4 t/h otpada čija je DTM između 6.000 kJ/kg i 7.500 kJ/kg (MCR+), odnosno 43,6 t/h kada se koristi otpad čija je DTM 8.500 kJ/kg (MCR). Projektna donja toplotna moć - DTM pri maksimalnom trajnom kapacitetu (MCR) iznosi 8.500 kJ/kg.

Kotao i prateća oprema su po tipu i kvalitetu prilagođeni za spaljivanje (insineraciju) komunalnog otpada ispunjavaju zahteve u pogledu protoka pare za turbinsko postrojenje, kao i ostale zahteve u pogledu pare u samom postrojenju.

Kotao je dizajniran i izrađen u skladu sa EN12952 i sa odgovarajućom CE oznakom o usaglašenosti proizvoda. Na početku tehnološkog procesa rade se doziranje otpada u postrojenje, koje se vrši usipnim kanalom koji se sastoji od usipnog levka i padnog kanala. Otpad se dozira pomoću automatizovanog klipnog dodavača direktno na rešetku ložišta (tipa „Martin“). Otpad, koji se potiskuje gravitaciono u padnoj šahti, rastresa se pomoću klipa, čime se postiže ujednačena distribucija goriva na rešetki. Ciklus doziranja otpada je povezan sa sistemom za regulaciju sagorevanja.

Aktivan i stabilan proces sagorevanja, u kome sve faze procesa primarnog sagorevanja (sušenje, gasifikacija, potpala i sagorevanje) učestvuju istovremeno i uzastopno, odvija se na prednjem delu rešetke. Nakon sagorevanja otpada, nastaje šljaka.

Kotao je vertikalna sa prirodnom cirkulacijom, jednim bubnjem i ovešenom čeličnom konstrukcijom. Sastoji se od 4 vertikalna prolaza:

- Prvi prolaz: ozračena komora za sagorevanje, vertikalni prolaz
- Drugi prolaz: vertikalni prolaz sa isparivačkim paketima
- Treći prolaz: vertikalni prolaz sa isparivačkim paketom i pregrejačima
- Četvrti prolaz: vertikalni prolaz sa paketima zagrejača vode

Iz kotlovske bubnja voda struji kroz negrejjane spusne cevi i napojne cevi do donjih kolektora isparivačke sekcije i dalje delimično isparava u grejnim isparivačkim cevima (panelima i snopovima). Tako dobijena smeša voda/para struji preko usponskih cevi i vraća se do bubnja, gde se odvija proces separacije tj. odvajanja vode od pare. Na izlazu iz parnog kotla postavljen je krajnji ekonomajzer (spoljni ekonomajzer) za potrebe hlađenja dimnih gasova do 140°S pre ulaska u suvi reaktor - suvi reakcioni kanal. Za potrebe drenaže i pražnjenja kotla biće obezbeđen sistem za pražnjenje. Startni rezervoar pod pritiskom dobija alternativno paru/kondenzat iz linije duvača gara tokom zagrevanja ovih linija, i prilikom startovanja kotla koristi se za održavanje nivoa u bubnju. Drugo odvajanje se vrši u atmosferskom rezervoaru. Parna faza se šalje u atmosferu.

4.3 Opis sistema za kontinualno uzorkovanje

Sistem za kontinualno uzorkovanje proizvođača TCR TECORA (DECS - Dioxin Emission Continuous Sampling) u CEMS kontejneru postrojenja EFW - Vinča se sastoji iz 2 Tecora DECS ormana:

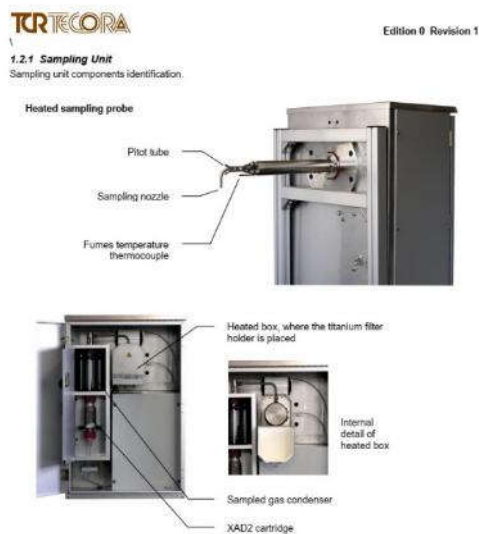
- Radni: Model - DECS, S/N - CU2040001
- Rezervni: Model - DECS, S/N - CU2040001



Slika br. 2 - Tecora DECS orman



Slika br. 3 - Izgled unutrašnjosti jednog Tecora DECS ormana



Slika br. 4 - komponente jedinice za uzorkovanje Tecora DECS sistema

1.1 Rezultati određivanja masenih koncentracija dioksina/furana (PCDD/PCDF)

| | | | | |
|--|---|----------------------|---|-----|
| Period uzorkovanja | 29.07.2025. godine - 29.08.2025. godine | | | |
| Identifikaciona oznaka uzorka | Oznaka operatera: 19 | | | |
| | Oznaka laboratorije ALS: PR25D0324001 | | | |
| | Oznaka laboratorije ANAHEM: 75100101 01 | | | |
| Normalizovana zapremina suvog otpadnog gasa provučena kroz sistem za uzorkovanje tokom perioda uzorkovanja i svedena na vrednost referentnog O ₂ od 11% (Nm ³) *Napomena: podatak dobijen od operatera | 786,832 | | | |
| Parametar ispitivanja | Jedinica | Masena koncentracija | | |
| 2378-TCDD | ng/Nm ³ | < 0,00001 | | |
| 12378-PeCDD | ng/Nm ³ | 0,00006 | ± | 30% |
| 123478-HxCDD | ng/Nm ³ | 0,0001 | ± | 30% |
| 123678-HxCDD | ng/Nm ³ | 0,00002 | ± | 30% |
| 123789-HxCDD | ng/Nm ³ | 0,00008 | ± | 30% |
| 1234678-HpCDD | ng/Nm ³ | 0,0014 | ± | 30% |
| OCDD | ng/Nm ³ | 0,001 | ± | 30% |

| Parametar ispitivanja | Jedinica | Masena koncentracija | | |
|-----------------------|--------------------|----------------------|---|-----|
| | | | | |
| 2378-TCDF | ng/Nm ³ | 0,00006 | ± | 30% |
| 12378-PeCDF | ng/Nm ³ | 0,00006 | ± | 30% |
| 23478-PeCDF | ng/Nm ³ | 0,00015 | ± | 30% |
| 123478-HxCDF | ng/Nm ³ | 0,00018 | ± | 30% |
| 123678-HxCDF | ng/Nm ³ | 0,00019 | ± | 30% |
| 123789-HxCDF | ng/Nm ³ | 0,00007 | ± | 30% |
| 234678-HxCDF | ng/Nm ³ | 0,00022 | ± | 30% |
| 1234678-HpCDF | ng/Nm ³ | 0,00042 | ± | 30% |
| 1234789-HpCDF | ng/Nm ³ | 0,00006 | ± | 30% |
| OCDF | ng/Nm ³ | 0,001 | ± | 30% |
| TEQ-Lowerbound | ng/Nm ³ | 0,00024 | ± | 30% |
| I-TEQ-Upperbound | ng/Nm ³ | 0,00025 | ± | 30% |
| WHO-TEQ-Upperbound | ng/Nm ³ | 0,00024 | ± | 30% |

1.2 Rezultati određivanja masenih koncentracija polihlorovanih bifenila (PCB)

| | | | | |
|--|---|----------------------|---|-----|
| Period uzorkovanja | 29.07.2025. godine - 29.08.2025. godine | | | |
| Identifikaciona oznaka uzorka | Oznaka operatera: 19 | | | |
| | Oznaka laboratorije ALS: PR25D0324001 | | | |
| | Oznaka laboratorije ANAHM: 75100101 01 | | | |
| Normalizovana zapremina suvog otpadnog gasa provučena kroz sistem za uzorkovanje tokom perioda uzorkovanja i svedena na vrednost referentnog O ₂ od 11% (Nm ³) *Napomena: podatak dobijen od operatera | 786,832 | | | |
| Parametar ispitivanja | Jedinica | Masena koncentracija | | |
| PCB 77 | ng/Nm ³ | 0,00057 | ± | 30% |
| PCB 81 | ng/Nm ³ | 0,0006 | ± | 30% |
| PCB 105 | ng/Nm ³ | < 0,00153 | | |
| PCB 114 | ng/Nm ³ | < 0,00012 | | |
| PCB 118 | ng/Nm ³ | < 0,00216 | | |
| PCB 123 | ng/Nm ³ | < 0,00001 | | |
| PCB 126 | ng/Nm ³ | 0,00029 | ± | 30% |
| PCB 156 | ng/Nm ³ | < 0,00046 | | |

| Parametar ispitivanja | Jedinica | Masena koncentracija | | |
|-----------------------|--------------------|----------------------|---|-----|
| PCB 157 | ng/Nm ³ | < 0,0002 | | |
| PCB 167 | ng/Nm ³ | < 0,00011 | | |
| PCB 169 | ng/Nm ³ | 0,00018 | ± | 30% |
| PCB 170 | ng/Nm ³ | < 0,00099 | | |
| PCB 180 | ng/Nm ³ | < 0,0014 | | |
| PCB 189 | ng/Nm ³ | < 0,00025 | | |
| TEQ (dl-PCB) - lower | ng/Nm ³ | 0,00003 | ± | 30% |
| TEQ (dl-PCB) - upper | ng/Nm ³ | 0,00003 | ± | 30% |
| WHO-TEQ-Upperbound | ng/Nm ³ | 0,00003 | ± | 30% |

1.3 Rezultati određivanja masenih koncentracija dioksina/furana (PCDD/PCDF)

| | | | |
|--|---|----------------------|-------|
| Period uzorkovanja | 29.08.2025. godine - 25.09.2025. godine | | |
| Identifikaciona oznaka uzorka | Oznaka operatera: 20 | | |
| | Oznaka laboratorije ALS: PR25D0324002 | | |
| | Oznaka laboratorije ANAHEM: 75100101 02 | | |
| Normalizovana zapremina suvog otpadnog gasa provučena kroz sistem za uzorkovanje tokom perioda uzorkovanja i svedena na vrednost referentnog O ₂ od 11% (Nm ³) *Napomena: podatak dobijen od operatera | 670,873 | | |
| Parametar ispitivanja | Jedinica | Masena koncentracija | |
| 2378-TCDD | ng/Nm ³ | < 0,00001 | |
| 12378-PeCDD | ng/Nm ³ | < 0,00001 | |
| 123478-HxCDD | ng/Nm ³ | 0,00055 | ± 30% |
| 123678-HxCDD | ng/Nm ³ | 0,00015 | ± 30% |
| 123789-HxCDD | ng/Nm ³ | 0,00006 | ± 30% |
| 1234678-HpCDD | ng/Nm ³ | 0,00055 | ± 30% |
| OCDD | ng/Nm ³ | 0,00042 | ± 30% |

| Parametar ispitivanja | Jedinica | Masena koncentracija | | |
|-----------------------|--------------------|----------------------|---|-----|
| 2378-TCDF | ng/Nm ³ | 0,00007 | ± | 30% |
| 12378-PeCDF | ng/Nm ³ | 0,00005 | ± | 30% |
| 23478-PeCDF | ng/Nm ³ | 0,00013 | ± | 30% |
| 123478-HxCDF | ng/Nm ³ | 0,00012 | ± | 30% |
| 123678-HxCDF | ng/Nm ³ | 0,00015 | ± | 30% |
| 123789-HxCDF | ng/Nm ³ | 0,00004 | ± | 30% |
| 234678-HxCDF | ng/Nm ³ | 0,00015 | ± | 30% |
| 1234678-HpCDF | ng/Nm ³ | 0,00021 | ± | 30% |
| 1234789-HpCDF | ng/Nm ³ | < 0,00003 | | |
| OCDF | ng/Nm ³ | < 0,0001 | | |
| TEQ-Lowerbound | ng/Nm ³ | 0,00013 | ± | 30% |
| I-TEQ-Upperbound | ng/Nm ³ | 0,00018 | ± | 30% |
| WHO-TEQ-Upperbound | ng/Nm ³ | 0,00016 | ± | 30% |

1.4 Rezultati određivanja masenih koncentracija polihlorovanih bifenila (PCB)

| | | |
|--|---|----------------------|
| Period uzorkovanja | 29.08.2025. godine - 25.09.2025. godine | |
| Identifikaciona oznaka uzorka | Oznaka operatera: 20 | |
| | Oznaka laboratorije ALS: PR25D0324002 | |
| | Oznaka laboratorije ANAHM: 75100101 02 | |
| Normalizovana zapremina suvog otpadnog gasa provučena kroz sistem za uzorkovanje tokom perioda uzorkovanja i svedena na vrednost referentnog O ₂ od 11% (Nm ³) *Napomena: podatak dobijen od operatera | 670,873 | |
| Parametar ispitivanja | Jedinica | Masena koncentracija |
| PCB 77 | ng/Nm ³ | < 0,00066 |
| PCB 81 | ng/Nm ³ | 0,001 ± 30% |
| PCB 105 | ng/Nm ³ | < 0,00131 |
| PCB 114 | ng/Nm ³ | < 0,00006 |
| PCB 118 | ng/Nm ³ | < 0,00283 |
| PCB 123 | ng/Nm ³ | < 0,00001 |
| PCB 126 | ng/Nm ³ | 0,00014 ± 30% |
| PCB 156 | ng/Nm ³ | < 0,00054 |

| Parametar ispitivanja | Jedinica | Masena koncentracija |
|-----------------------|--------------------|----------------------|
| PCB 157 | ng/Nm ³ | < 0,00024 |
| PCB 167 | ng/Nm ³ | < 0,00025 |
| PCB 169 | ng/Nm ³ | 0,00011 ± 30% |
| PCB 170 | ng/Nm ³ | < 0,00098 |
| PCB 180 | ng/Nm ³ | < 0,00238 |
| PCB 189 | ng/Nm ³ | < 0,00024 |
| TEQ (dl-PCB) - lower | ng/Nm ³ | 0,00002 ± 30% |
| TEQ (dl-PCB) - upper | ng/Nm ³ | 0,00002 ± 30% |
| WHO-TEQ-Upperbound | ng/Nm ³ | 0,00002 ± 30% |

1.5 Upoređivanje rezultata ispitivanja sa graničnim vrednostima emisije (GVE)

| | | | | | |
|---|--------------------|---|---|-----|--|
| <i>Period uzorkovanja</i> | | 29.07.2025. godine - 29.08.2025. godine | | | |
| Identifikaciona oznaka uzorka | | Oznaka operatera: 19 | | | |
| | | Oznaka laboratorije ALS: PR25D0324001 | | | |
| | | Oznaka laboratorije ANAHM: 75100101 01 | | | |
| <i>Parametar</i> | <i>Jedinica</i> | <i>Masena koncentracija</i> | | | <i>Granična vrednost emisije (GVE)</i> |
| I-TEQ-Upperbound (PCDD/PCDF) | ng/Nm ³ | 0,00025 | ± | 30% | 0,06 ng/Nm ³ |
| WHO-TEQ-Upperbound (PCDF/PCFD) + WHO-TEQ-Upperbound (PCB) | ng/Nm ³ | 0,00027 | ± | 30% | 0,08 ng/Nm ³ |

| | | | | | |
|---|--------------------|---|---|-----|--|
| <i>Period uzorkovanja</i> | | 29.08.2025. godine - 25.09.2025. godine | | | |
| Identifikaciona oznaka uzorka | | Oznaka operatera: 20 | | | |
| | | Oznaka laboratorije ALS: PR25D0324002 | | | |
| | | Oznaka laboratorije ANAHM: 75100101 02 | | | |
| <i>Parametar</i> | <i>Jedinica</i> | <i>Masena koncentracija</i> | | | <i>Granična vrednost emisije (GVE)</i> |
| I-TEQ-Upperbound (PCDD/PCDF) | ng/Nm ³ | 0,00018 | ± | 30% | 0,06 ng/Nm ³ |
| WHO-TEQ-Upperbound (PCDF/PCFD) + WHO-TEQ-Upperbound (PCB) | ng/Nm ³ | 0,00018 | ± | 30% | 0,08 ng/Nm ³ |

*GVE definisane u Prilogu 2, Deo II_Postrojenja za energetska iskoriscenje netretiranog komunalnog otpada Uredbe o tehnickim i tehnoloskim uslovima za projektovanje, izdradnju, opremanje i rad postrojenja i vrstama otpada za termicki tretman otpada, granicne vrednosti emisije i njihovo pracenje („Sl. glasnik RS”, br. 103/2023).

- Rezultati merenja koncentracija izmerenih parametara ispitivanja su svedeni na suv otpadni gas i normalne uslove (t=273,15⁰ K; p=101,3 kPa);
- Rezultati merenja se odnose samo na navedeno postrojenje u uslovima merenja definisanim od strane naručioca ispitivanja.



Izradio:

Aleksandar Jeremić, dipl.hem.

Rukovodilac laboratorije za
ispitivanje vazduha

m.p.

Latinka Slavković Beškoski, dipl. fiz.hem.

Prilog 1: Izveštaj laboratorije ALS br. PR25D0324



CERTIFICATE OF ANALYSIS

| | | | |
|---------------------|---|---------------------|---|
| Work Order | : PR25D0324 | Issue Date | : 24-Oct-2025 |
| Customer | : ANAHM DOO | Laboratory | : ALS Czech Republic, s.r.o. |
| Contact | : Goran Ancevic | Contact | : Client Service |
| Address | : Mocarтова 10 11000 Belgrade Serbia | Address | : Na Harfe 336/9 Prague 9 - Vysocany 190 00 Czech Republic |
| E-mail | : voda@anahem.org | E-mail | : customer.support@alsglobal.com |
| Telephone | : +381 658 473 934 | Telephone | : +420 226 226 228 |
| Project | : ---- | Page | : 1 of 3 |
| Order number | : ---- | Date Samples | : 10-Oct-2025 |
| | | Received | |
| | | Quote number | : PR2022ANADO-RS0001 (CZ-205-22-0768) |
| Site | : ---- | Date of test | : 13-Oct-2025 - 24-Oct-2025 |
| Sampled by | : customer | QC Level | : ALS CR Standard Quality Control Schedule |

General Comments

This report shall not be reproduced except in full, without prior written approval from the laboratory. The laboratory is not responsible for the sample data supplied by the customer and their impact on the validity of the result. The laboratory declares that the test results relate only to the listed samples. If "ALS" is not included in the test report in the "Sampled by" section, then the results refer to the sample as received.

Responsible for accuracy

Signatories
Lubomir Pokorný

Position
Country Manager

Testing Laboratory No. 1163
Accredited by CAI according to
CSN EN ISO/IEC 17025:2018



The company is certified according to ČSN EN ISO 14001 (Environmental management systems) and ČSN ISO 45001 (Occupational health and safety management systems)



Analytical Results

| Sub-Matrix: EMISSIONS | | | | Client sample ID | | 75100101 01 | | 75100101 02 | | ---- | |
|---|------------|-----|-----------|-----------------------------|---------|---------------|---------|---------------|------|--------|------|
| | | | | Laboratory sample ID | | PR25D0324001 | | PR25D0324002 | | ---- | |
| | | | | Client sampling date / time | | [10-Oct-2025] | | [10-Oct-2025] | | ---- | |
| Parameter | Method | LOR | Unit | Result | MU | Result | MU | Result | MU | Result | MU |
| PCDDs and PCDFs (Dioxins and Furans) | | | | | | | | | | | |
| 2378-TCDD | A-DFHMS02 | - | ng/sample | <0.0051 | ---- | <0.0071 | ---- | ---- | ---- | ---- | ---- |
| 12378-PeCDD | A-DFHMS02 | - | ng/sample | 0.0480 | ± 30.0% | <0.013 | ---- | ---- | ---- | ---- | ---- |
| 123478-HxCDD | A-DFHMS02 | - | ng/sample | 0.0810 | ± 30.0% | 0.0370 | ± 30.0% | ---- | ---- | ---- | ---- |
| 123678-HxCDD | A-DFHMS02 | - | ng/sample | 0.180 | ± 30.0% | 0.0980 | ± 30.0% | ---- | ---- | ---- | ---- |
| 123789-HxCDD | A-DFHMS02 | - | ng/sample | 0.0620 | ± 30.0% | 0.0410 | ± 30.0% | ---- | ---- | ---- | ---- |
| 1234678-HpCDD | A-DFHMS02 | - | ng/sample | 1.10 | ± 30.0% | 0.370 | ± 30.0% | ---- | ---- | ---- | ---- |
| OCDD | A-DFHMS02 | - | ng/sample | 0.790 | ± 30.0% | 0.280 | ± 30.0% | ---- | ---- | ---- | ---- |
| 2378-TCDF | A-DFHMS02 | - | ng/sample | 0.0510 | ± 30.0% | 0.0450 | ± 30.0% | ---- | ---- | ---- | ---- |
| 12378-PeCDF | A-DFHMS02 | - | ng/sample | 0.0510 | ± 30.0% | 0.0340 | ± 30.0% | ---- | ---- | ---- | ---- |
| 23478-PeCDF | A-DFHMS02 | - | ng/sample | 0.120 | ± 30.0% | 0.0900 | ± 30.0% | ---- | ---- | ---- | ---- |
| 123478-HxCDF | A-DFHMS02 | - | ng/sample | 0.140 | ± 30.0% | 0.0780 | ± 30.0% | ---- | ---- | ---- | ---- |
| 123678-HxCDF | A-DFHMS02 | - | ng/sample | 0.150 | ± 30.0% | 0.0980 | ± 30.0% | ---- | ---- | ---- | ---- |
| 123789-HxCDF | A-DFHMS02 | - | ng/sample | 0.0540 | ± 30.0% | 0.0300 | ± 30.0% | ---- | ---- | ---- | ---- |
| 234678-HxCDF | A-DFHMS02 | - | ng/sample | 0.170 | ± 30.0% | 0.100 | ± 30.0% | ---- | ---- | ---- | ---- |
| 1234678-HpCDF | A-DFHMS02 | - | ng/sample | 0.330 | ± 30.0% | 0.140 | ± 30.0% | ---- | ---- | ---- | ---- |
| 1234789-HpCDF | A-DFHMS02 | - | ng/sample | 0.0450 | ± 30.0% | <0.023 | ---- | ---- | ---- | ---- | ---- |
| OCDF | A-DFHMS02 | - | ng/sample | 0.0790 | ± 30.0% | <0.067 | ---- | ---- | ---- | ---- | ---- |
| TEQ-Lowerbound | A-DFHMS02 | - | ng/sample | 0.19 | ---- | 0.087 | ---- | ---- | ---- | ---- | ---- |
| TEQ-Upperbound | A-DFHMS02 | - | ng/sample | 0.19 | ---- | 0.11 | ---- | ---- | ---- | ---- | ---- |
| PCB dioxin-like HRMS | | | | | | | | | | | |
| PCB 77 | A-PCBHMS03 | - | ng/sample | 0.450 | ± 30.0% | <0.44 | ---- | ---- | ---- | ---- | ---- |
| PCB 81 | A-PCBHMS03 | - | ng/sample | 0.0470 | ± 30.0% | 0.0670 | ± 30.0% | ---- | ---- | ---- | ---- |
| PCB 105 | A-PCBHMS03 | - | ng/sample | <1.2 | ---- | <0.88 | ---- | ---- | ---- | ---- | ---- |
| PCB 114 | A-PCBHMS03 | - | ng/sample | <0.097 | ---- | <0.04 | ---- | ---- | ---- | ---- | ---- |
| PCB 118 | A-PCBHMS03 | - | ng/sample | <1.7 | ---- | <1.9 | ---- | ---- | ---- | ---- | ---- |
| PCB 123 | A-PCBHMS03 | - | ng/sample | <0.002 | ---- | <0.0048 | ---- | ---- | ---- | ---- | ---- |
| PCB 126 | A-PCBHMS03 | - | ng/sample | 0.230 | ± 30.0% | 0.0910 | ± 30.0% | ---- | ---- | ---- | ---- |
| PCB 156 | A-PCBHMS03 | - | ng/sample | <0.36 | ---- | <0.36 | ---- | ---- | ---- | ---- | ---- |
| PCB 157 | A-PCBHMS03 | - | ng/sample | <0.16 | ---- | <0.16 | ---- | ---- | ---- | ---- | ---- |
| PCB 167 | A-PCBHMS03 | - | ng/sample | <0.088 | ---- | <0.17 | ---- | ---- | ---- | ---- | ---- |
| PCB 169 | A-PCBHMS03 | - | ng/sample | 0.140 | ± 30.0% | 0.0740 | ± 30.0% | ---- | ---- | ---- | ---- |
| PCB 170 | A-PCBHMS03 | - | ng/sample | <0.78 | ---- | <0.66 | ---- | ---- | ---- | ---- | ---- |
| PCB 180 | A-PCBHMS03 | - | ng/sample | <1.1 | ---- | <1.6 | ---- | ---- | ---- | ---- | ---- |
| PCB 189 | A-PCBHMS03 | - | ng/sample | <0.2 | ---- | <0.16 | ---- | ---- | ---- | ---- | ---- |
| TEQ (dl-PCB) - lower | A-PCBHMS03 | - | ng/sample | 0.027 | ---- | 0.011 | ---- | ---- | ---- | ---- | ---- |
| TEQ (dl-PCB) - upper | A-PCBHMS03 | - | ng/sample | 0.027 | ---- | 0.011 | ---- | ---- | ---- | ---- | ---- |

When sampling date is not provided by the client, the laboratory determines it for procedural reasons, then it is equal to the date of receipt of the sample to the laboratory and is displayed in brackets. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor k = 2, representing 95% confidence level.

Key: LOR = Limit of reporting, MU = Measurement Uncertainty. The MU does not include sampling uncertainty.

Brief Method Summaries

| Analytical Methods | Method Descriptions |
|--|---|
| Location of test performance: V Raji 906 / Cacke 261 Pardubice Czech Republic 530 02 | |
| A-DFHMS02 | CZ_SOP_D06_06_174 (CSN EN 1948-2, CSN EN 1948-3): Determination of polychlorinated dibenzo-p-dioxins and dibenzofuranes in emission samples by isotope dilution method using HRGC-HRMS and calculation of TEQ parameters from measured values. The samples were stored in laboratory in the darkness and under temperature <4°C. Actual LOQ are noticed in the attachment. |

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Customer : ANAHEM DOO



| Analytical Methods | Method Descriptions |
|--------------------|---|
| A-PCBHMS03 | CZ_SOP_D06_06_179 (ČSN EN 1948-4, US EPA Method TO-4A) Determination of PCB by isotope dilution method using HRGC-HRMS and calculation of PCB sums from measured values. The samples were stored in laboratory in the darkness and under temperature <4°C. Actual LOQ are noticed in the annex. |

The symbol "" for the method indicates a test outside the scope of accreditation of the laboratory or subcontractor. If the UNICO-SUB code is stated in the method table, this only informs that the tests have been performed by a subcontractor and the results are given in an annex to the test report, including information on test accreditation. If the lab used for matrix outside the scope of accreditation or non-standard sample matrix procedure specified in the accredited method and issues non-accredited results, this fact is stated on the title page of this protocol in the section "Notes". If the test report shows the results of subcontracting, the place of performance of the test is outside the laboratories of ALS Czech Republic, s.r.o.

The method for calculating of the summation parameters is available on request in the customer service.

The end of the certificate of analysis

Attachment no. 1 to the Certificate of Analysis for work order PR25D0324

Sample:

75100101 01

ALS SAMPLE ID: PR25D0324/ 001

Measurement results PCDD/Fs:

| Sample: 75100101 01 | | Final extract [μ l]: 60 | | | |
|--|-----------------------|--|---|---------------------|------------------------------------|
| | | Injection volume [μ l]: 4 | | | |
| | | Acquisition date [d.m.y h:m]: 21.10.25 15:12 | | | |
| 2,3,7,8-PCDD/Fs | Result [ng/sample] | Limit of Detection [ng/sample] | Limit of Quantification [ng/sample] | ¹ I-TEFs | I-TEQ Upperbound [ng/sample] |
| 2,3,7,8-TCDD | < 0.0051 | 0.0051 | 0.01 | 1 | 0.0051 |
| 1,2,3,7,8-PeCDD | 0.048 | 0.0053 | 0.011 | 0.5 | 0.024 |
| 1,2,3,4,7,8-HxCDD | 0.081 | 0.0092 | 0.018 | 0.1 | 0.0081 |
| 1,2,3,6,7,8-HxCDD | 0.18 | 0.0092 | 0.018 | 0.1 | 0.018 |
| 1,2,3,7,8,9-HxCDD | 0.062 | 0.0092 | 0.018 | 0.1 | 0.0062 |
| 1,2,3,4,6,7,8-HpCDD | 1.1 | 0.013 | 0.026 | 0.01 | 0.011 |
| OCDD | 0.79 | 0.017 | 0.034 | 0.001 | 0.00079 |
| 2,3,7,8-TCDF | 0.051 | 0.0055 | 0.011 | 0.1 | 0.0051 |
| 1,2,3,7,8-PeCDF | 0.051 | 0.0066 | 0.013 | 0.05 | 0.0025 |
| 2,3,4,7,8-PeCDF | 0.12 | 0.0066 | 0.013 | 0.5 | 0.061 |
| 1,2,3,4,7,8-HxCDF | 0.14 | 0.0083 | 0.017 | 0.1 | 0.014 |
| 1,2,3,6,7,8-HxCDF | 0.15 | 0.0083 | 0.017 | 0.1 | 0.015 |
| 1,2,3,7,8,9-HxCDF | 0.054 | 0.0083 | 0.017 | 0.1 | 0.0054 |
| 2,3,4,6,7,8-HxCDF | 0.17 | 0.0083 | 0.017 | 0.1 | 0.017 |
| 1,2,3,4,6,7,8-HpCDF | 0.33 | 0.011 | 0.023 | 0.01 | 0.0033 |
| 1,2,3,4,7,8,9-HpCDF | 0.045 | 0.011 | 0.023 | 0.01 | 0.00045 |
| OCDF | 0.079 | 0.017 | 0.033 | 0.001 | 0.000079 |
| I-TEQ from quantified 2,3,7,8-PCDD/Fs - "Lowerbound" | | | | | 0.19 |
| I-TEQ from 2,3,7,8-PCDD/Fs - "Mediumbound" | | | | | 0.19 |
| Maximum possible I-TEQ - "Upperbound" | | | | | 0.2 |
| PCDDs | Result [ng/sample] | PCDFs | Result [ng/sample] | | |
| Tetra-CDDs | 8.2 | Tetra-CDFs | 4.2 | | |
| Penta-CDDs | 5.8 | Penta-CDFs | 2.3 | | |
| Hexa-CDDs | 8.1 | Hexa-CDFs | 1.8 | | |
| Hepta-CDDs | 2.7 | Hepta-CDFs | 0.37 | | |
| OCDD | 0.79 | OCDF | 0.079 | | |

¹I-TEF according to NATO.

Limits of quantification are defined as double of the detection limits.

The limit of detection is defined as the amount of analyte producing a signal with $S/N \geq 3$.

The value of the detection limit is mentioned as the actual value at the acquisition date.

Measurement uncertainty is expressed as a double ($k=2$) relative standard deviation (RSD%), and corresponds to 95% confidence interval.

Estimation of uncertainty of each 2,3,7,8-PCDD/F congener is 30% and total I-TEQ is 20%.

These values were ensured by analyses of certified reference material under conditions of internal reproducibility.

Results marked with "<" are below limit of detection or quantification.

"Lowerbound" and "Upperbound" are levels defined in Regulation 2017/644 and EN 1948-4.

"Mediumbound" is levels defined in Regulation 2017/644.

Attachment no. 1 to the Certificate of Analysis for work order PR25D0324

Sample:

75100101 01

Standards recovery:

| Sample: | | 75100101 01 | | | |
|-----------------------------|-----------------|-------------------------------|-----------------|-------------------------------------|-----------------------|
| | | Final extract [μ l]: | | 60 | |
| | | Injection volume [μ l]: | | 4 | |
| | | Acquisition date [d.m.y h:m]: | | 21.10.25 15:12 | |
| Extraction standard | Recovery | Acceptable range [%] | | Accept. rec. with respect to | |
| | [%] | Basic | Extended | basic range | extended range |
| PCDDs | | | | | |
| 13C12 - 2,3,7,8-TCDD | 100 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,7,8-PeCDD | 95 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,4,7,8-HxCDD | 100 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,6,7,8-HxCDD | 110 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,4,6,7,8-HpCDD | 56 | 40 - 130 | 20 - 150 | YES | - |
| 13C12 - OCDD | 55 | 40 - 130 | 20 - 150 | YES | - |
| PCDFs | | | | | |
| 13C12 - 2,3,7,8-TCDF | 95 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 2,3,4,7,8-PeCDF | 100 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,4,7,8-HxCDF | 98 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,6,7,8-HxCDF | 76 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 2,3,4,6,7,8-HxCDF | 94 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,4,6,7,8-HpCDF | 67 | 40 - 130 | 20 - 150 | YES | - |
| 13C12 - OCDF | 51 | 40 - 130 | 20 - 150 | YES | - |
| Sampling standard | Recovery | Acceptable range | | Rec. in range? | |
| | [%] | [%] | | | |
| 13C12-1,2,3,7,8-PeCDF | 100 | > 50 | | YES | |
| 13C12-1,2,3,7,8,9-HxCDF | 89 | > 50 | | YES | |
| 13C12-1,2,3,4,7,8,9-HpCDF | 94 | > 50 | | YES | |

Attachment no. 2 to the Certificate of Analysis for work order PR25D0324

Sample:

75100101 02

ALS SAMPLE ID: PR25D0324/ 002

Measurement results PCDD/Fs:

| Sample: 75100101 02 | | Final extract [µl]: 60 | | | |
|---|-----------------------|--|---|---------------------|------------------------------------|
| | | Injection volume [µl]: 4 | | | |
| | | Acquisition date [d.m.y h:m]: 21.10.25 16:05 | | | |
| 2,3,7,8-PCDD/Fs | Result [ng/sample] | Limit of Detection [ng/sample] | Limit of Quantification [ng/sample] | ¹ I-TEFs | I-TEQ Upperbound [ng/sample] |
| 2,3,7,8-TCDD | < 0.0071 | 0.0071 | 0.014 | 1 | 0.0071 |
| 1,2,3,7,8-PeCDD | < 0.013 | 0.0065 | 0.013 | 0.5 | 0.0065 |
| 1,2,3,4,7,8-HxCDD | 0.037 | 0.015 | 0.029 | 0.1 | 0.0037 |
| 1,2,3,6,7,8-HxCDD | 0.098 | 0.015 | 0.029 | 0.1 | 0.0098 |
| 1,2,3,7,8,9-HxCDD | 0.041 | 0.015 | 0.029 | 0.1 | 0.0041 |
| 1,2,3,4,6,7,8-HpCDD | 0.37 | 0.023 | 0.046 | 0.01 | 0.0037 |
| OCDD | 0.28 | 0.028 | 0.057 | 0.001 | 0.00028 |
| 2,3,7,8-TCDF | 0.045 | 0.0047 | 0.0094 | 0.1 | 0.0045 |
| 1,2,3,7,8-PeCDF | 0.034 | 0.0059 | 0.012 | 0.05 | 0.0017 |
| 2,3,4,7,8-PeCDF | 0.09 | 0.0059 | 0.012 | 0.5 | 0.045 |
| 1,2,3,4,7,8-HxCDF | 0.078 | 0.0096 | 0.019 | 0.1 | 0.0078 |
| 1,2,3,6,7,8-HxCDF | 0.098 | 0.0096 | 0.019 | 0.1 | 0.0098 |
| 1,2,3,7,8,9-HxCDF | 0.03 | 0.0096 | 0.019 | 0.1 | 0.003 |
| 2,3,4,6,7,8-HxCDF | 0.1 | 0.0096 | 0.019 | 0.1 | 0.01 |
| 1,2,3,4,6,7,8-HpCDF | 0.14 | 0.011 | 0.023 | 0.01 | 0.0014 |
| 1,2,3,4,7,8,9-HpCDF | < 0.023 | 0.011 | 0.023 | 0.01 | 0.00023 |
| OCDF | < 0.067 | 0.033 | 0.067 | 0.001 | 0.000067 |
| I-TEQ from quantified 2,3,7,8-PCDD/Fs -"Lowerbound" | | | | | 0.11 |
| I-TEQ from 2,3,7,8-PCDD/Fs -,"Mediumbound" | | | | | 0.11 |
| Maximum possible I-TEQ -"Upperbound" | | | | | 0.12 |
| PCDDs | Result [ng/sample] | PCDFs | Result [ng/sample] | | |
| Tetra-CDDs | 6.3 | Tetra-CDFs | 3.1 | | |
| Penta-CDDs | 4.2 | Penta-CDFs | 1.4 | | |
| Hexa-CDDs | 4.2 | Hexa-CDFs | 1.2 | | |
| Hepta-CDDs | 1.1 | Hepta-CDFs | 0.15 | | |
| OCDD | 0.28 | OCDF | < 0.067 | | |

¹I-TEF according to NATO.

Limits of quantification are defined as double of the detection limits.

The limit of detection is defined as the amount of analyte producing a signal with S/N≥3.

The value of the detection limit is mentioned as the actual value at the acquisition date.

Measurement uncertainty is expressed as a double (k=2) relative standard deviation (RSD%), and corresponds to 95% confidence interval.

Estimation of uncertainty of each 2,3,7,8-PCDD/F congener is 30% and total I-TEQ is 20%.

These values were ensured by analyses of certified reference material under conditions of internal reproducibility.

Results marked with "<" are below limit of detection or quantification.

"Lowerbound" and "Upperbound" are levels defined in Regulation 2017/644 and EN 1948-4.

"Mediumbound" is levels defined in Regulation 2017/644.

Attachment no. 2 to the Certificate of Analysis for work order PR25D0324

Sample:

75100101 02

Standards recovery:

| Sample: | | 75100101 02 | | | |
|-----------------------------|-----------------|-------------------------------|-----------------|-------------------------------------|-----------------------|
| | | Final extract [μ l]: | | 60 | |
| | | Injection volume [μ l]: | | 4 | |
| | | Acquisition date [d.m.y h:m]: | | 21.10.25 16:05 | |
| Extraction standard | Recovery | Acceptable range [%] | | Accept. rec. with respect to | |
| PCDDs | [%] | Basic | Extended | basic range | extended range |
| 13C12 - 2,3,7,8-TCDD | 67 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,7,8-PeCDD | 60 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,4,7,8-HxCDD | 55 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,6,7,8-HxCDD | 57 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,4,6,7,8-HpCDD | 42 | 40 - 130 | 20 - 150 | YES | - |
| 13C12 - OCDD | 43 | 40 - 130 | 20 - 150 | YES | - |
| PCDFs | | | | | |
| 13C12 - 2,3,7,8-TCDF | 58 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 2,3,4,7,8-PeCDF | 97 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,4,7,8-HxCDF | 74 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,6,7,8-HxCDF | 80 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 2,3,4,6,7,8-HxCDF | 73 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,4,6,7,8-HpCDF | 69 | 40 - 130 | 20 - 150 | YES | - |
| 13C12 - OCDF | 52 | 40 - 130 | 20 - 150 | YES | - |
| Sampling standard | Recovery | Acceptable range | | Rec. in range? | |
| | [%] | [%] | | | |
| 13C12-1,2,3,7,8-PeCDF | 100 | > 50 | | YES | |
| 13C12-1,2,3,7,8,9-HxCDF | 100 | > 50 | | YES | |
| 13C12-1,2,3,4,7,8,9-HpCDF | 110 | > 50 | | YES | |

Attachment no. 3 to the Certificate of Analysis for work order PR25D0324

Sample:

75100101 01

ALS SAMPLE ID: PR25D0324/ 001

Measurement results PCBs:

| Sample: 75100101 01 | | | | | |
|--|-----------------------|--------------------------------------|---|--|--|
| Final extract [µl]: | | | | | 250 |
| Injection volume [µl]: | | | | | 4 |
| Acquisition date [d.m.y h:m]: | | | | | 21.10.25 13:59 |
| PCBs | Result [ng/sample] | Limit of Detection [ng/sample] | Limit of Quantification [ng/sample] | ¹ WHO-TEFs | WHO-TEQ Upperbound [ng/sample] |
| PCB #77 | 0.45 | 0.0009 | 0.44 | 0.0001 | 0.000045 |
| PCB #81 | 0.047 | 0.00084 | 0.023 | 0.0003 | 0.000014 |
| PCB #126 | 0.23 | 0.001 | 0.0034 | 0.1 | 0.023 |
| PCB #169 | 0.14 | 0.0016 | 0.0054 | 0.03 | 0.0042 |
| PCB #105 | < 1.2 | 0.0019 | 1.2 | 0.00003 | 0.000035 |
| PCB #114 | < 0.097 | 0.0012 | 0.097 | 0.00003 | 0.0000029 |
| PCB #118 | < 1.7 | 0.0012 | 1.7 | 0.00003 | 0.000051 |
| PCB #123 | < 0.002 | 0.002 | 0.0066 | 0.00003 | 0.000000059 |
| PCB #156 | < 0.36 | 0.0012 | 0.36 | 0.00003 | 0.000011 |
| PCB #157 | < 0.16 | 0.0014 | 0.16 | 0.00003 | 0.0000048 |
| PCB #167 | < 0.088 | 0.0012 | 0.088 | 0.00003 | 0.0000027 |
| PCB #170 | < 0.78 | 0.0016 | 0.78 | - | 0 |
| PCB #180 | < 1.1 | 0.0016 | 1.1 | - | 0 |
| PCB #189 | < 0.2 | 0.0019 | 0.2 | 0.00003 | 0.000006 |
| WHO-TEQ from quantified PCBs -"Lowerbound" | | | | | 0.027 |
| WHO-TEQ from PCBs -,"Mediumbound" | | | | | 0.027 |
| Maximum possible WHO-TEQ -"Upperbound" | | | | | 0.027 |
| PCBs | Result [ng/sample] | Limit of Detection [ng/sample] | Limit of Quantification [ng/sample] | Indicator PCB Lowerbound [ng/sample] | Indicator PCB Upperbound [ng/sample] |
| PCB #28 | < 5.8 | 0.0025 | 5.8 | 0 | 5.8 |
| PCB #52 | < 3.3 | 0.0014 | 3.3 | 0 | 3.3 |
| PCB #101 | < 3.1 | 0.0015 | 3.1 | 0 | 3.1 |
| PCB #118 | < 1.7 | 0.0012 | 1.7 | 0 | 1.7 |
| PCB #138 | < 1.5 | 0.0016 | 1.5 | 0 | 1.5 |
| PCB #153 | < 1.6 | 0.0012 | 1.6 | 0 | 1.6 |
| PCB #180 | < 1.1 | 0.0016 | 1.1 | 0 | 1.1 |
| Indicator PCB6 -"Lowerbound" | | | | 0 | |
| Maximal possible Indicator PCB6 -"Upperbound" | | | | | 16 |
| Indicator PCB7 -"Lowerbound" | | | | 0 | |
| Maximal possible Indicator PCB7 -"Upperbound" | | | | | 18 |

¹WHO 2005 TEF according to Van den Berg et al: Toxicological Sciences Advance Acces, 7 July 2006

Limits of quantification are defined on the base of blank level.

The limit of detection is defined as the amount of analyte producing a signal with S/N≥3.

The value of the detection limit is mentioned as the actual value at the acquisition date.

Measurement uncertainty is expressed as a double (k=2) relative standard deviation (RSD%), and corresponds to 95% confidence interval.

Estimation of uncertainty of each PCB congener is 30% , total WHO-TEQ and PCB6/PCB7 is 20%.

These values were ensured by analyses of certified reference material under conditions of internal reproducibility.

Results marked "<" are lower than the limit of detection or quantification.

"Lowerbound" and "Upperbound" are levels defined in Regulation 2017/644 and EN 1948-4.

"Mediumbound" is level defined in Regulation 2017/644.

Attachment no. 3 to the Certificate of Analysis for work order PR25D0324

| | | | |
|----------------------------------|--------------|-------------------------------|----------------|
| Sample: | 75100101 01 | Final extract [μ l]: | 250 |
| | | Injection volume [μ l]: | 4 |
| | | Acquisition date [d.m.y h:m]: | 21.10.25 13:59 |
| Sampling standard | Recovery [%] | Acceptable range [%] | Rec. in range? |
| 13C12-2,3,4,4'-tetraCB (60) | 94 | > 50 | YES |
| 13C12-2,3,3',4,5,5'-hexaCB (159) | 87 | > 50 | YES |

Attachment no. 4 to the Certificate of Analysis for work order PR25D0324

Sample: 75100101 02

ALS SAMPLE ID: PR25D0324/ 002

Measurement results PCBs:

| Sample: 75100101 02 | | | | | |
|---|-----------------------|--------------------------------------|---|---|---|
| Final extract [μ l]: | | | | | 250 |
| Injection volume [μ l]: | | | | | 4 |
| Acquisition date [d.m.y h:m]: | | | | | 21.10.25 16:47 |
| PCBs | Result [ng/sample] | Limit of Detection [ng/sample] | Limit of Quantification [ng/sample] | ¹ WHO-TEFs | WHO-TEQ Upperbound [ng/sample] |
| PCB #77 | < 0.44 | 0.0022 | 0.44 | 0.0001 | 0.000044 |
| PCB #81 | 0.067 | 0.0022 | 0.023 | 0.0003 | 0.00002 |
| PCB #126 | 0.091 | 0.0019 | 0.0064 | 0.1 | 0.0091 |
| PCB #169 | 0.074 | 0.0031 | 0.01 | 0.03 | 0.0022 |
| PCB #105 | < 0.88 | 0.0025 | 0.88 | 0.00003 | 0.000026 |
| PCB #114 | < 0.04 | 0.0027 | 0.04 | 0.00003 | 0.0000012 |
| PCB #118 | < 1.9 | 0.0027 | 1.9 | 0.00003 | 0.000056 |
| PCB #123 | < 0.0048 | 0.0048 | 0.016 | 0.00003 | 0.00000014 |
| PCB #156 | < 0.36 | 0.0025 | 0.36 | 0.00003 | 0.000011 |
| PCB #157 | < 0.16 | 0.0025 | 0.16 | 0.00003 | 0.0000048 |
| PCB #167 | < 0.17 | 0.0022 | 0.17 | 0.00003 | 0.000005 |
| PCB #170 | < 0.66 | 0.0031 | 0.66 | - | 0 |
| PCB #180 | < 1.6 | 0.0031 | 1.6 | - | 0 |
| PCB #189 | < 0.16 | 0.0037 | 0.16 | 0.00003 | 0.0000049 |
| WHO-TEQ from quantified PCBs -"Lowerbound" | | | | | 0.011 |
| WHO-TEQ from PCBs -,"Mediumbound" | | | | | 0.011 |
| Maximum possible WHO-TEQ -"Upperbound" | | | | | 0.011 |
| PCBs | Result [ng/sample] | Limit of Detection [ng/sample] | Limit of Quantification [ng/sample] | Σ indicator PCB Lowerbound [ng/sample] | Σ indicator PCB Upperbound [ng/sample] |
| PCB #28 | < 4.9 | 0.0058 | 4.9 | 0 | 4.9 |
| PCB #52 | < 3.8 | 0.004 | 3.8 | 0 | 3.8 |
| PCB #101 | < 2 | 0.0041 | 2 | 0 | 2 |
| PCB #118 | < 1.9 | 0.0027 | 1.9 | 0 | 1.9 |
| PCB #138 | < 3 | 0.0033 | 3 | 0 | 3 |
| PCB #153 | < 2.6 | 0.0028 | 2.6 | 0 | 2.6 |
| PCB #180 | < 1.6 | 0.0031 | 1.6 | 0 | 1.6 |
| Σ indicator PCB6 -"Lowerbound" | | | | 0 | |
| Maximal possible Σindicator PCB6 -"Upperbound" | | | | | 18 |
| Σ indicator PCB7 -"Lowerbound" | | | | 0 | |
| Maximal possible Σindicator PCB7 -"Upperbound" | | | | | 20 |

¹WHO 2005 TEF according to Van den Berg et al: Toxicological Sciences Advance Acces, 7 July 2006

Limits of quantification are defined on the base of blank level.

The limit of detection is defined as the amount of analyte producing a signal with $S/N \geq 3$.

The value of the detection limit is mentioned as the actual value at the acquisition date.

Measurement uncertainty is expressed as a double ($k=2$) relative standard deviation (RSD%), and corresponds to 95% confidence interval.

Estimation of uncertainty of each PCB congener is 30% , total WHO-TEQ and PCB6/PCB7 is 20%.

These values were ensured by analyses of certified reference material under conditions of internal reproducibility.

Results marked "<" are lower than the limit of detection or quantification.

"Lowerbound" and "Upperbound" are levels defined in Regulation 2017/644 and EN 1948-4.

"Mediumbound" is level defined in Regulation 2017/644.

Attachment no. 4 to the Certificate of Analysis for work order PR25D0324

| | | | |
|--|--------------|-------------------------------|----------------|
| Sample: | 75100101 02 | Final extract [μ l]: | 250 |
| | | Injection volume [μ l]: | 4 |
| | | Acquisition date [d.m.y h:m]: | 21.10.25 16:47 |
| Sampling standard | Recovery [%] | Acceptable range [%] | Rec. in range? |
| ¹³ C12-2,3,4,4'-tetraCB (60) | 105 | > 50 | YES |
| ¹³ C12-2,3,3',4,5,5'-hexaCB (159) | 104 | > 50 | YES |

Attachment no. 5 to the Certificate of Analysis for work order PR25D0324

Sample: 75100101 01

ALS SAMPLE ID: PR25D0324/ 001

Measurement results PCDD/Fs:

| Sample: 75100101 01 | | Final extract [μ l]: 60 | | | |
|---|-----------------------|--|---|-----------------------|--------------------------------------|
| | | Injection volume [μ l]: 4 | | | |
| | | Acquisition date [d.m.y h:m]: 21.10.25 15:12 | | | |
| 2,3,7,8-PCDD/Fs | Result [ng/sample] | Limit of Detection [ng/sample] | Limit of Quantification [ng/sample] | ¹ WHO-TEFs | WHO-TEQ Upperbound [ng/sample] |
| 2,3,7,8-TCDD | < 0.0051 | 0.0051 | 0.01 | 1 | 0.0051 |
| 1,2,3,7,8-PeCDD | 0.048 | 0.0053 | 0.011 | 1 | 0.048 |
| 1,2,3,4,7,8-HxCDD | 0.081 | 0.0092 | 0.018 | 0.1 | 0.0081 |
| 1,2,3,6,7,8-HxCDD | 0.18 | 0.0092 | 0.018 | 0.1 | 0.018 |
| 1,2,3,7,8,9-HxCDD | 0.062 | 0.0092 | 0.018 | 0.1 | 0.0062 |
| 1,2,3,4,6,7,8-HpCDD | 1.1 | 0.013 | 0.026 | 0.01 | 0.011 |
| OCDD | 0.79 | 0.017 | 0.034 | 0.0003 | 0.00024 |
| 2,3,7,8-TCDF | 0.051 | 0.0055 | 0.011 | 0.1 | 0.0051 |
| 1,2,3,7,8-PeCDF | 0.051 | 0.0066 | 0.013 | 0.03 | 0.0015 |
| 2,3,4,7,8-PeCDF | 0.12 | 0.0066 | 0.013 | 0.3 | 0.037 |
| 1,2,3,4,7,8-HxCDF | 0.14 | 0.0083 | 0.017 | 0.1 | 0.014 |
| 1,2,3,6,7,8-HxCDF | 0.15 | 0.0083 | 0.017 | 0.1 | 0.015 |
| 1,2,3,7,8,9-HxCDF | 0.054 | 0.0083 | 0.017 | 0.1 | 0.0054 |
| 2,3,4,6,7,8-HxCDF | 0.17 | 0.0083 | 0.017 | 0.1 | 0.017 |
| 1,2,3,4,6,7,8-HpCDF | 0.33 | 0.011 | 0.023 | 0.01 | 0.0033 |
| 1,2,3,4,7,8,9-HpCDF | 0.045 | 0.011 | 0.023 | 0.01 | 0.00045 |
| OCDF | 0.079 | 0.017 | 0.033 | 0.0003 | 0.000024 |
| WHO-TEQ from quantified 2,3,7,8-PCDD/Fs -"Lowerbound" | | | | | 0.19 |
| WHO-TEQ from 2,3,7,8-PCDD/Fs -,"Mediumbound" | | | | | 0.19 |
| Maximum possible WHO-TEQ -"Upperbound" | | | | | 0.19 |
| PCDDs | Result [ng/sample] | PCDFs | Result [ng/sample] | | |
| Tetra-CDDs | 8.2 | Tetra-CDFs | 4.2 | | |
| Penta-CDDs | 5.8 | Penta-CDFs | 2.3 | | |
| Hexa-CDDs | 8.1 | Hexa-CDFs | 1.8 | | |
| Hepta-CDDs | 2.7 | Hepta-CDFs | 0.37 | | |
| OCDD | 0.79 | OCDF | 0.079 | | |

¹WHO 2005 TEF according to Van den Berg et al: Toxicological Sciences Advance Acces, 7 July 2006)

Limits of quantification are defined as double of the detection limits.

The limit of detection is defined as the amount of analyte producing a signal with $S/N \geq 3$.

The value of the detection limit is mentioned as the actual value at the acquisition date.

Measurement uncertainty is expressed as a double ($k=2$) relative standard deviation (RSD%), and corresponds to 95% confidence interval.

Estimation of uncertainty of each 2,3,7,8-PCDD/F congener is 30% and total WHO-TEQ is 20%.

These values were ensured by analyses of certified reference material under conditions of internal reproducibility.

Results marked with "<" are below limit of detection or quantification.

"Lowerbound" and "Upperbound" are levels defined in Regulation 2017/644 and EN 1948-4.

"Mediumbound" is levels defined in Regulation 2017/644.

Attachment no. 5 to the Certificate of Analysis for work order PR25D0324

Sample:

75100101 01

Standards recovery:

| Sample: | | 75100101 01 | | | |
|-----------------------------|-----------------|-------------------------------|-----------------|-------------------------------------|-----------------------|
| | | Final extract [μ l]: | | 60 | |
| | | Injection volume [μ l]: | | 4 | |
| | | Acquisition date [d.m.y h:m]: | | 21.10.25 15:12 | |
| Extraction standard | Recovery | Acceptable range [%] | | Accept. rec. with respect to | |
| | [%] | Basic | Extended | basic range | extended range |
| PCDDs | | | | | |
| 13C12 - 2,3,7,8-TCDD | 100 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,7,8-PeCDD | 95 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,4,7,8-HxCDD | 100 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,6,7,8-HxCDD | 110 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,4,6,7,8-HpCDD | 56 | 40 - 130 | 20 - 150 | YES | - |
| 13C12 - OCDD | 55 | 40 - 130 | 20 - 150 | YES | - |
| PCDFs | | | | | |
| 13C12 - 2,3,7,8-TCDF | 95 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 2,3,4,7,8-PeCDF | 100 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,4,7,8-HxCDF | 98 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,6,7,8-HxCDF | 76 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 2,3,4,6,7,8-HxCDF | 94 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,4,6,7,8-HpCDF | 67 | 40 - 130 | 20 - 150 | YES | - |
| 13C12 - OCDF | 51 | 40 - 130 | 20 - 150 | YES | - |
| Sampling standard | Recovery | Acceptable range | | Rec. in range? | |
| | [%] | [%] | | | |
| 13C12-1,2,3,7,8-PeCDF | 100 | > 50 | | YES | |
| 13C12-1,2,3,7,8,9-HxCDF | 89 | > 50 | | YES | |
| 13C12-1,2,3,4,7,8,9-HpCDF | 94 | > 50 | | YES | |

Attachment no. 6 to the Certificate of Analysis for work order PR25D0324

Sample:

75100101 02

ALS SAMPLE ID: PR25D0324/ 002

Measurement results PCDD/Fs:

| Sample: 75100101 02 | | Final extract [µl]: 60 | | | |
|---|--------------------|--|-------------------------------------|-----------------------|--------------------------------|
| | | Injection volume [µl]: 4 | | | |
| | | Acquisition date [d.m.y h:m]: 21.10.25 16:05 | | | |
| 2,3,7,8-PCDD/Fs | Result [ng/sample] | Limit of Detection [ng/sample] | Limit of Quantification [ng/sample] | ¹ WHO-TEFs | WHO-TEQ Upperbound [ng/sample] |
| 2,3,7,8-TCDD | < 0.0071 | 0.0071 | 0.014 | 1 | 0.0071 |
| 1,2,3,7,8-PeCDD | < 0.013 | 0.0065 | 0.013 | 1 | 0.013 |
| 1,2,3,4,7,8-HxCDD | 0.037 | 0.015 | 0.029 | 0.1 | 0.0037 |
| 1,2,3,6,7,8-HxCDD | 0.098 | 0.015 | 0.029 | 0.1 | 0.0098 |
| 1,2,3,7,8,9-HxCDD | 0.041 | 0.015 | 0.029 | 0.1 | 0.0041 |
| 1,2,3,4,6,7,8-HpCDD | 0.37 | 0.023 | 0.046 | 0.01 | 0.0037 |
| OCDD | 0.28 | 0.028 | 0.057 | 0.0003 | 0.000085 |
| 2,3,7,8-TCDF | 0.045 | 0.0047 | 0.0094 | 0.1 | 0.0045 |
| 1,2,3,7,8-PeCDF | 0.034 | 0.0059 | 0.012 | 0.03 | 0.001 |
| 2,3,4,7,8-PeCDF | 0.09 | 0.0059 | 0.012 | 0.3 | 0.027 |
| 1,2,3,4,7,8-HxCDF | 0.078 | 0.0096 | 0.019 | 0.1 | 0.0078 |
| 1,2,3,6,7,8-HxCDF | 0.098 | 0.0096 | 0.019 | 0.1 | 0.0098 |
| 1,2,3,7,8,9-HxCDF | 0.03 | 0.0096 | 0.019 | 0.1 | 0.003 |
| 2,3,4,6,7,8-HxCDF | 0.1 | 0.0096 | 0.019 | 0.1 | 0.01 |
| 1,2,3,4,6,7,8-HpCDF | 0.14 | 0.011 | 0.023 | 0.01 | 0.0014 |
| 1,2,3,4,7,8,9-HpCDF | < 0.023 | 0.011 | 0.023 | 0.01 | 0.00023 |
| OCDF | < 0.067 | 0.033 | 0.067 | 0.0003 | 0.00002 |
| WHO-TEQ from quantified 2,3,7,8-PCDD/Fs -"Lowerbound" | | | | | 0.087 |
| WHO-TEQ from 2,3,7,8-PCDD/Fs -,"Mediumbound" | | | | | 0.097 |
| Maximum possible WHO-TEQ -"Upperbound" | | | | | 0.11 |
| PCDDs | Result [ng/sample] | PCDFs | Result [ng/sample] | | |
| Tetra-CDDs | 6.3 | Tetra-CDFs | 3.1 | | |
| Penta-CDDs | 4.2 | Penta-CDFs | 1.4 | | |
| Hexa-CDDs | 4.2 | Hexa-CDFs | 1.2 | | |
| Hepta-CDDs | 1.1 | Hepta-CDFs | 0.15 | | |
| OCDD | 0.28 | OCDF | < 0.067 | | |

¹WHO 2005 TEF according to Van den Berg et al: Toxicological Sciences Advance Acces, 7 July 2006)

Limits of quantification are defined as double of the detection limits.

The limit of detection is defined as the amount of analyte producing a signal with S/N>3.

The value of the detection limit is mentioned as the actual value at the acquisition date.

Measurement uncertainty is expressed as a double (k=2) relative standard deviation (RSD%), and corresponds to 95% confidence interval.

Estimation of uncertainty of each 2,3,7,8-PCDD/F congener is 30% and total WHO-TEQ is 20%.

These values were ensured by analyses of certified reference material under conditions of internal reproducibility.

Results marked with "<" are below limit of detection or quantification.

"Lowerbound" and "Upperbound" are levels defined in Regulation 2017/644 and EN 1948-4.

"Mediumbound" is levels defined in Regulation 2017/644.

Attachment no. 6 to the Certificate of Analysis for work order PR25D0324

Sample:

75100101 02

Standards recovery:

| Sample: | | 75100101 02 | | | |
|-----------------------------|-----------------|-------------------------------|-----------------|-------------------------------------|-----------------------|
| | | Final extract [μ l]: | | 60 | |
| | | Injection volume [μ l]: | | 4 | |
| | | Acquisition date [d.m.y h:m]: | | 21.10.25 16:05 | |
| Extraction standard | Recovery | Acceptable range [%] | | Accept. rec. with respect to | |
| | [%] | Basic | Extended | basic range | extended range |
| PCDDs | | | | | |
| 13C12 - 2,3,7,8-TCDD | 67 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,7,8-PeCDD | 60 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,4,7,8-HxCDD | 55 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,6,7,8-HxCDD | 57 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,4,6,7,8-HpCDD | 42 | 40 - 130 | 20 - 150 | YES | - |
| 13C12 - OCDD | 43 | 40 - 130 | 20 - 150 | YES | - |
| PCDFs | | | | | |
| 13C12 - 2,3,7,8-TCDF | 58 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 2,3,4,7,8-PeCDF | 97 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,4,7,8-HxCDF | 74 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,6,7,8-HxCDF | 80 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 2,3,4,6,7,8-HxCDF | 73 | 50 - 130 | 30 - 150 | YES | - |
| 13C12 - 1,2,3,4,6,7,8-HpCDF | 69 | 40 - 130 | 20 - 150 | YES | - |
| 13C12 - OCDF | 52 | 40 - 130 | 20 - 150 | YES | - |
| Sampling standard | Recovery | Acceptable range | | Rec. in range? | |
| | [%] | [%] | | | |
| 13C12-1,2,3,7,8-PeCDF | 100 | > 50 | | YES | |
| 13C12-1,2,3,7,8,9-HxCDF | 100 | > 50 | | YES | |
| 13C12-1,2,3,4,7,8,9-HpCDF | 110 | > 50 | | YES | |