



EA MLA Signatory
Český institut pro akreditaci, o.p.s.
(Czech Accreditation Institute)
Hájkova 2747/22, Žižkov, 130 00 Praha 3

issues

according to section 16 of Act No. 22/1997 Coll., on technical requirements for products and on changes and amendments to some Acts, as amended

CERTIFICATE OF ACCREDITATION

No. 532/2025

Vysoká škola báňská – Technická univerzita Ostrava
with registered office 17. listopadu 2172/15, 708 00 Ostrava – Poruba
Company Registration No. 61989100

for the Testing Laboratory No. **1166.3**
Energy Research Center, Testing Laboratory

Scope of accreditation:

Emissions measurement, including sampling, determination of physical and chemical properties of substances, analyses of fuels, including fuel hydrogen, chemical analysis of drinking water, surface water, ground water and waste water, aqueous leachates, soils, waste, emissions, immissions, workplace air, sediments, construction and silicate materials to the extent as specified in the appendix to this Certificate.

This Certificate of Accreditation is a proof of accreditation issued on the basis of assessment of fulfillment of the accreditation criteria in accordance with

ČSN EN ISO/IEC 17025:2018

In its activities performed within the scope and for the period of validity of this Certificate, the abovementioned Accredited Body is entitled to refer to this Certificate, provided that the accreditation is not suspended and the Accredited Body meets the specified accreditation requirements in accordance with the relevant regulations applicable to the activity of an accredited conformity assessment body.

This Certificate of Accreditation replaces, to the full extent, Certificate No.: 686/2024 of 18/12/2024, and/or any administrative acts building upon it.

The Certificate of Accreditation is valid until: **10/08/2028**

Prague: 22/10/2025



Signed in the Czech original:
Gor Petrosjan on 22/10/2025

Jan Velíšek
Director of the Department
of Testing and Calibration Laboratories
Czech Accreditation Institute

This translation of the Czech original has been issued by: Eliška Frycová

**The Appendix is an integral part of
Certificate of Accreditation No. 532/2025 of 22/10/2025**

Accredited entity according to ČSN EN ISO/IEC 17025:2018:

Vysoká škola báňská – Technická univerzita Ostrava
CAB number 1166.3, Energy Research Center, Testing Laboratory
17. listopadu 2172/15, 708 00 Ostrava - Poruba

Testing laboratory locations:

1. **VEC Laboratories** 17. listopadu 2172/15, 708 00 Ostrava – Poruba, VEC Building
2. **IET Laboratory** 17. listopadu 2172/15, 708 00 Ostrava – Poruba, IET Building

The laboratory applies a flexible approach to the scope of accreditation.

The current list of activities carried out within the flexible scope is available on the laboratory's website <https://ceet.vsb.cz/vec/cs/sluzby/> in the form of the „List of activities within the flexible scope of accreditation“.

Detailed information on activities within the scope of accreditation (determined analytes / tested subject) is given in the section „Specification of the scope of accreditation“.

Tests:

Ordinal number ¹	Test procedure / method name	Test procedure / method identification ²	Tested subject	Degrees of freedom ³
1* ¹	Determination of the mass concentration of CO ₂ , SO ₂ , NO _x , CO by automated analyzers (NDIR)	VECS 001, cl. 2, 4 to 6 (ČSN ISO 7935; ČSN ISO 10849; ČSN EN 15058; ČSN P CEN/TS 17405; ČSN ISO 21258)	Emission	-
2* ¹	Determination of the mass concentration of nitrogen oxide (NO _x) by automated analyzers (chemiluminescence)	VECS 005 (ČSN EN 14792)	Emission	-
3* ¹	Determination of the mass concentration of oxygen (O ₂) by an automated analyzer (paramagnetic method)	VECS 001, cl. 3 (ČSN EN 14789)	Emission	-
4* ¹	Determination of total mass concentration of organic compounds expressed as total organic carbon (TOC) by automatic analyzers (FID)	VECS 007 (ČSN EN 12619)	Emission	-
5 ¹	Determination of the mass concentration of solid pollutants by gravimetry	VECS 003 (ČSN EN 13284-1)	Emission	-
6* ¹	Determination of water vapour (condensation and absorption method, capacitance detector)	VECO 001 (ČSN EN 14790)	Emission	-
7* ¹	Determination of pressure	VECO 002 (ČSN ISO 10780)	Emission, outdoor air	-
8* ¹	Determination of temperature	VECO 003 (ČSN 25 8010:1989)	Emission, outdoor air	-

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Ordinal number ¹	Test procedure / method name	Test procedure / method identification ²	Tested subject	Degrees of freedom ³
9 ¹	Determination of ash content by gravimetry, calculation of combustible matter (unburned residue)	VECO 004, excl. chap. 6 (ČSN ISO 1171; ČSN EN ISO 21656; ČSN EN ISO 18122)	Solid fossil fuels, solid biofuels, solid alternative fuels, solid combustion residues	-
10 ¹	Determination of ash content by thermogravimetry, calculation of combustible matter (unburned residue)	VECO 004, chap. 6 (ČSN ISO 1171; ČSN EN ISO 21656; ČSN EN ISO 18122)	Solid fossil fuels, solid biofuels, solid alternative fuels, solid combustion residues	-
11 ¹	Determination of Water Content by Gravimetry	VECO 005, excl. chap. 6 (ČSN 44 1377; ČSN ISO 579; ČSN ISO 687; ČSN EN ISO 18134-2; ČSN EN ISO 18134-3; ČSN P CEN/TS 15414-2; ČSN EN ISO 21660-3)	Solid fuels, solid biofuels, solid alternative fuels, solid combustion residues	-
12 ¹	Determination of water content by thermogravimetry	VECO 005, chap. 6 (ČSN 44 1377; ČSN ISO 579; ČSN ISO 687; ČSN EN ISO 18134-2; ČSN EN ISO 18134-3; ČSN P CEN/TS 15414-2; ČSN EN ISO 21660-3)	Solid fossil fuels, solid biofuels, solid alternative fuels, solid combustion residues	-
13* ¹	Determination of velocity and volume flow of gas	VECS 008 (ČSN ISO 10780)	Emission	-
14 ¹	Determination of the mass concentration of persistent organic compounds (PCDD/PCDF, PCB, PAH) by calculation from measured values ⁴	VECS 009 (ČSN EN 1948-1; ČSN EN 1948-4+A1; ISO 11338-1)	Emission	-
15 ¹	Determination of the mass concentration of As, Cd, Cr, Co, Cu, Mn, Ni, Pb, Sb, Tl, V, Hg by calculation from measured values ⁴	VECS 010 (ČSN EN 14385; ČSN EN 13211)	Emission	-
16 ¹	Determination of the mass concentration of gases and vapours (HCl, HF, SO ₂ , ammonia) by calculation from measured values ⁴	VECS 011 (ČSN EN 1911; ČSN P CEN/TS 17340; ČSN EN 14791; ČSN 83 4728-1)	Emission	-

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Ordinal number ¹	Test procedure / method name	Test procedure / method identification ²	Tested subject	Degrees of freedom ³
17 ¹	Determination of the mass concentration of volatile organic compounds (VOC) by calculation from measured values ⁴	VECS 012 (ČSN P CEN/TS 13649)	Emission	-
18* ¹	Determination of the mass concentration of CO ₂ , SO ₂ , NO _x , CO, H ₂ O, TOC, N ₂ O, NO ₂ , HCl, HF, NH ₃ and SO ₃ by automated analyzers (FTIR)	VECS 013 (EPA Method 320; ČSN P CEN/TS 17337)	Emission	-
19* ¹	Determination of mixture moisture and mass concentration of ammonia (NH ₃) by automated analyzer (TDLS)	VECS 014 (ČSN ISO 10155; (Manual to SICK analyzer GME 700-091)	Emission	-
20 ¹	Determination of the content of volatile combustible matter by gravimetry	VECL 001 (ČSN ISO 562; ČSN ISO 5071-1; ČSN EN ISO 18123; ČSN EN ISO 22167)	Solid fossil fuels, solid biofuels, Solid alternative fuels	-
21 ¹	Determination of gross calorific value and calculation of net calorific value	VECL 002 (ČSN ISO 1928; ČSN EN ISO 18125; ČSN EN ISO 21654)	Solid fossil fuels, solid biofuels, solid alternative fuels	-
22 ¹	Determination of carbon, hydrogen, nitrogen by combustion method with IR and TC detection of gaseous components, determination of oxygen by calculation	VECL 003 (ČSN ISO 29541; ČSN ISO 17247; ČSN EN ISO 16948; EN ISO 16948; ČSN EN ISO 16993; ČSN EN ISO 21663; EN ISO 21663; ČSN 44 1355)	Solid fossil fuels, solid biofuels, solid alternative fuels, solid combustion residues	-
23 ¹	Determination of total sulphur by high temperature combustion method with IR detection of gaseous components	VECL 004 (ČSN ISO 19579; ČSN ISO 17247; ČSN EN ISO 16993; ČSN EN ISO 16994; EN ISO 16994; ČSN EN ISO 21663; EN ISO 21663)	Solid fossil fuels, solid biofuels, solid alternative fuels, solid combustion residues	-

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Ordinal number ¹	Test procedure / method name	Test procedure / method identification ²	Tested subject	Degrees of freedom ³
24 ¹	Determination of ash fusibility temperature	VECL 005 (ČSN ISO 540; ISO 540; ČSN EN ISO 21404; EN ISO 21404; TNI CEN/TR 15404; CEN/TR 15404)	Solid fossil fuels, solid biofuels, solid alternative fuels, solid combustion residues	-
25* ¹	Determination of total mass concentration of mercury (Hg) in gas phase by automated analyzer (CVAAS)	VECS 015 (ČSN EN 14884)	Emissions	-
26 ¹	Determination of maximum explosion pressure, maximum rate of explosion pressure rise, lower explosion limit and limit oxygen concentration of dust clouds	VECB 002 (ČSN EN 14034-1+A1; ČSN EN 14034-2+A1; ČSN EN 14034-3+A1; ČSN EN 14034-4+A1)	Dust clouds	-
27 ¹	Determination of maximum explosion pressure and maximum rate of explosion pressure rise of gases and vapours of liquids	VECB 003 (ČSN EN 15967)	Gases and vapours of liquids	-
28 ¹	Determination of upper and lower explosion limit of gases and vapours of liquids	VECB 004 (ČSN EN 1839 cl. 4.5.2)	Gases and vapours of liquids	-
29 ¹	Determination of the limiting oxygen concentration for flammable gases and vapours	VECB 005 (ČSN EN 1839 cl. 4.5.3)	Gases and vapours of liquids	-
30* ¹	Quality assurance of automated measuring systems	VECS 016 (ČSN EN 14181, cl. 6 QAL2, cl. 8 AST)	Automated emission measuring systems	-
31 ¹	Determination of bulk density using a measuring vessel by gravimetry	VECL 006 (ČSN EN ISO 17828; ČSN P CEN/TS 15401)	Solid biofuels, solid alternative biofuels	-
32 ¹	Determination of particle size distribution by gravimetry	VECL 007 (ČSN EN ISO 17827-2; ČSN EN 15415-1)	Solid biofuels, solid alternative biofuels	-
33* ¹	Determination of H ₂ purity by OFCEAS, GC/MS and GC/TDC method	VECS 017 (ČSN ISO 19880-8; ČSN ISO 14687)	Hydrogen	-

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Ordinal number ¹	Test procedure / method name	Test procedure / method identification ²	Tested subject	Degrees of freedom ³
34 ^{1*}	Gravimetric determination of H ₂ purity	VECS 018 (ČSN ISO 19880-1; ČSN ISO 14687)	Hydrogen	-
35 ²	Determination of Na, Mg, Al, Si, P, S, K, Ca, Ti, Fe, Mn, Cl, V, Cr, Co, Ni, Cu, Zn, Ga, Ge, As, Se, Br, Rb, Sr, Y, Zr, Nb, Mo, Ag, Cd, In, Sn, Sb, Te, I, Cs, Ba, La, Ce, Ta, W, Hg, Tl, Pb, Bi, Th and U by XRF method	VECS 024 (Spectro Xepos manual)	Soil, sediments from watercourses and reservoirs, solid fuels, construction and silicate materials, waste from the combustion of solid fuels, waste from iron production and processing, construction material waste, mine spoils, emissions – filter media	A, B, D
36 ²	Determination of polycondensed aromatic hydrocarbons by HPLC/PDA/FLD method	VECS 022 (US EPA method 8310; US EPA TO 13)	Rinsing solutions, filters and solid sorbents from emission, immission and workplace environment measurements	A, B, D
37 ²	Determination of volatile organic compounds by gas chromatography method (GC/MS)	VECS 023 (US EPA method 8240; Perkin Elmer Thermal Desorber manual)	Solid sorbents from emission, immission and working environment measurement	A, B, D
38 ²	Determination of hydrocarbons by gas chromatography method (FID)	VECS 019 (US EPA method 8015C; ČSN EN 14039)	Filters and solid sorbents from emission, immission and working environment measurement	A, B, D
39 ²	Determination of anions by ion chromatography method with conductivity detection	VECS 020 (ČSN EN ISO 10304-1; ČSN EN ISO 10304-3; Institute Fondazione Salvatore Maugeri application notes)	Waste water, surface water, aqueous solutions and leachates, absorption solutions, leachates from sorption sampling tubes – emissions, immissions	A, B, D
40 ²	Determination of pH by potentiometry	VECS 026 (ČSN ISO 10523; ČSN EN 12457-4)	Drinking, surface, ground, waste water and leachates	A

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Ordinal number ¹	Test procedure / method name	Test procedure / method identification ²	Tested subject	Degrees of freedom ³
41 ²	Determination of ammonia and ammonium by the indophenol method	VECS 021 (ČSN 835711; ČSN ISO 23695; Institute Fondazione Salvatore Maugeri application notes)	Waste water, river water, surface water, aqueous solutions and leachates, absorption solutions, leachates from sorption sampling tubes (emissions, immissions)	A
42 ²	Determination of chlorine, fluorine, and bromine content by ion chromatography after decomposition in a bomb calorimeter	VECS 025 (ČSN EN 15408)	Solid and liquid fuels, solid alternative fuels, biomass, biofuels, waste	A, B, D

¹ asterisk at the ordinal number identifies the tests, which the laboratory is qualified to carry out outside the permanent laboratory premises; the numerical index at the test ordinal number identifies the location carrying out the test (the identification of the locations is given on the first page of this document)

² if the document identifying the test procedure is dated, only these specific procedures are used. If the document identifying the test procedure is not dated, the latest valid edition of the specified procedure is used (including any changes)

³ degrees of freedom: A – Flexibility concerning materials/products (subject of the test), B – Flexibility concerning components/parameters/characteristics, C – Flexibility concerning the performance of the method, D – Flexibility concerning the method

The laboratory can modify the test procedures with the specified degree(s) of freedom in the scope of accreditation while maintaining the principle of measurement. If no degree of freedom is specified, the laboratory cannot apply a flexible approach to the scope of accreditation for the test.

⁴ laboratory determination of the analytes in the sample is carried out by an external test provider within the scope of its accreditation

Specification of the scope of accreditation:

Ordinal test number	Detailed information on activities within the scope of accreditation (determined analytes)
35	Expressed in the form of the elements listed or in the form of oxides: Na ₂ O, MgO, Al ₂ O ₃ , SiO ₂ , P ₂ O ₅ , SO ₃ , K ₂ O, CaO, TiO ₂ , MnO, Fe ₂ O ₃ , BaO, SrO
36	Naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, indeno[1,2,3-cd]pyrene, dibenzo[ah]anthracene, benzo[ghi]perylene
37	Benzene, tetrachloromethane, trichloromethane, chloroform, cis-1,2-dichloroethene, 1,1-dichloroethene, ethylbenzene, methylchlorid, styrene, 1,1,2,2-tetrachloroethane, tetrachloroethene, toluene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene, xylenes
38	C ₁₀ -C ₄₀ , benzene, toluene, styrene, ethylbenzene, xylenes, trichloroethene, tetrachloroethene
39	Fluorides F ⁻ , chlorides Cl ⁻ , bromides Br ⁻ , nitrites NO ₂ ⁻ , nitrates NO ₃ ⁻ , phosphates PO ₄ ³⁻ , sulphites SO ₃ ²⁻ , sulphates SO ₄ ²⁻ In the case of immission, expressed in the form of the listed anions or in the form of oxides: NO ₂ , SO ₂

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Specification of the scope of accreditation:

Ordinal test number	Detailed information on activities within the scope of accreditation (tested subject)
9 – 12, 20 – 24	Solid fossil fuels – black coal, brown coal, coke
27 – 29	Liquids – combustible liquids with suspended solids and liquids prone to forming a surface film under the specific test conditions
36–39	Immissions: ambient air sampling
39–41	Leachates: aqueous leachates of waste and solid samples, leachates of materials
39	Absorption solutions: after combustion in a bomb calorimeter

Sampling:

Ordinal number ²	Sampling procedure name	Sampling procedure identification ¹	Subject of sampling
1 ¹	Sampling of persistent organic compounds (PCDD/PCDF, PCB, PAH) - isokinetic sampling with automatic or manual isokinetic control, filtration condensation method	VECV 001 (ČSN EN 1948-1)	Emission
2 ¹	Sampling for the determination of heavy metals (As, Cd, Cr, Co, Cu, Mn, Ni, Pb, Sb, Tl, V, Hg) - isokinetic sampling with automatic or manual isokinetic control and absorption into liquid	VECV 002 (ČSN EN 14385; ČSN EN 13211; ČSN EN 13284-1)	Emission
3 ¹	Sampling of gases and vapours (HCl, HF, SO ₂ and NH ₃) by absorption into liquid	VECV 003 (ČSN EN 1911; ČSN P CEN/TS 17340; ČSN 83 4728-2; ČSN EN 14791)	Emission
4 ¹	Sampling of organic compounds (VOC) by capture on a solid sorbent	VECV 004 (ČSN P CEN/TS 13649)	Emission
5 ¹	Sampling of solid pollutants (isokinetic sampling with automatic or manual isokinetic control)	VECV 005 (ČSN EN 13284-1)	Emission
6 ¹	Sampling of H ₂ to determine its purity	VECV 006 (ČSN ISO 19880-1)	Hydrogen

¹ if the document identifying the sampling procedure is dated, only these specific procedures are used. If the document identifying the sampling procedure is not dated, the latest edition of the specified procedure is used (including any changes)

² superscript at the sampling ordinal number identifies the number of the location carrying out the sampling (the locations are identified on the first page of the document)

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Explanations and abbreviations:

Emissions	- Waste gas containing pollutants released in a controlled manner or leaking into atmosphere from air pollution sources
Liquids	- Combustible liquids with suspended solids and liquids prone to forming a surface film under the specific test conditions
FD/FLD	- Fluorescence Detector
FID	- Flame Ionization Detection
FLDCVAAS	- Cold Vapour Atomic Absorption Spectrometry
EPA Method	- Environmental Protection Agency (USA) method
FTIR	- Fourier Transformation Infrared Spectroscopy
GC/MS	- Gas Chromatography/Mass Spectrometry
GC/TCD	- Gas Chromatography/Thermal Conductivity Detector
HPLC	- High-Performance Liquid Chromatography
IET	- Institute of Environmental Technologies
NDIR	- Non-Dispersive Infrared Spectroscopy
OFCEAS	- Optical Feedback Cavity-Enhanced Absorption Spectroscopy
PAH	- Polycyclic Aromatic Hydrocarbons
PCB	- Polychlorinated biphenyls
PCDD	- Polychlorinated dibenzodioxins
PCDF	- Polychlorinated dibenzofurans
PDA	- Diode Array Detector
TDLS	- Diode Laser Spectroscopy
TOC	- Total Organic Carbon
TZL	- Solid Pollutants
US EPA	- United States Environmental Protection Agency
VEC	- Energy Research Centre
VECB	- Internal testing procedure in the field of safety
VECL	- Internal testing procedure in the field of fuels
VECO	- Internal testing procedure for other tests (e.g. basic parameters, temperature, pressure, concentration)
VECS	- Internal testing procedure in the field of combustion products
VECV	- Internal sampling procedure
VOC	- Volatile Organic Compounds

"This document is an appendix to the certificate of accreditation. In case of any discrepancies between the English and Czech versions, the Czech version shall prevail, both for the certificate appendix and the certificate itself. "