

**The Appendix is an integral part of  
Certificate of Accreditation 242/2023 of 12/05/2023**

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

**Výzkumný ústav pivovarský a sladařský, a.s.**  
CAB number 1309, Analytical Testing Laboratory – Brewing Institute Prague  
Lípová 511/15, Nové Město, 120 00 Praha 2

*The laboratory has a flexible scope of accreditation permitted as detailed in the Annex.*

*Updated list of activities provided within the required flexible scope of accreditation is available at the laboratory from the Quality Manager.*

**Tests:**

Ordinal number <sup>1</sup>	Test procedure/method name	Test procedure/method identification <sup>2</sup>	Test object
1	Determination of liquid sample extract by densitometry	SOP No. 1 (EBC 8.3)	Beer, sweet wort, wort, non-alcoholic and low-alcoholic beverages
2	Determination of apparent and real extract, specific gravity, alcohol, fermentation of apparent, real and original extract of beer by densitometry and NIR, and energy value by calculation from measured values	SOP No. 2 (EBC 9.2.1 and 9.4, 9.45, Regulation (EU) No 1169/2011)	Beer, mixed beer, malt beverages, beercoolers
3	Determination of bitterness by spectrophotometry	SOP No. 3 (EBC 9.8)	Beer
4	Determination of color by spectrophotometry	SOP No. 4 (EBC 9.6)	Beer
5	Determination of pH by potentiometry	SOP No. 5 (EBC 9.35)	Beer, sweet wort, wort
6	Determination of haze by nephelometry	SOP No. 6 (MEBAK 2.14.1.2)	Beer
7	Determination of carbon dioxide by multi-volume expansion method	SOP No. 7 (MEBAK 2.26.1.5)	Beer, carbonated beverages, sparkling wine, mineral water
8	Determination of foam stability by NIBEM	SOP No. 8 (MEBAK 2.18.2)	Beer
9	Determination of NDMA and other volatile N-nitrosamines by GC – TEA and their sum by calculation from measured values <sup>8</sup>	SOP No. 9 (Spiegelhalter B. et al. (1983) IARC Sci. Publ. 45, 115; Čulík et al.: Kvasný Průmysl (1998) 10, 289)	Malt, cereals, beer, alcoholic beverages

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Ordinal number <sup>1</sup>	Test procedure/method name	Test procedure/method identification <sup>2</sup>	Test object
10	Determination of NDMA and other volatile N-nitrosamines in solid sorbents by GC – TEA and their sum by calculation from measured values <sup>8</sup>	SOP No. 9A (NIOSH 2522, NIOSH Manual of Analytical Methods, 4. ed., 1994)	Solid sorbents
11	Determination of NDMA and other volatile N-nitrosamines in rubber products by GC – TEA and their sum by calculation from measured values <sup>8</sup>	SOP No. 9B (ČSN EN 12868; ČSN EN 14350-2)	Rubber products
12	Determination of ATNC (total N–nitroso compounds) by chemiluminescence	SOP No. 10 (BRFI –Section AM/030, Issue 01/95-2)	Wort, sweet wort, beer
13	Determination of nitrate in beverages and raw material by HPLC-UV	SOP No. 11 (Garaj J. et al. in the book Analytická chémia, Alfa Bratislava 1987, s. 158; Čepička J. et al. (1991) Kvasný Průmysl, 37, 230)	Malt, hop, hop products, beer and intermediate products, non-alcoholic, low-alcohol and alcoholic beverages, brewing aqua
14	Determination of $\alpha$ - and $\beta$ -bitter acids in hop and hop products by HPLC-UV	SOP No. 12 (EBC 7.2, 7.7)	Hop and hop products
15	Determination of conductometric value of hop by titration	SOP No. 13 (EBC 7.2, 7.4, 7.5, 7.6)	Hop and hop products
16	Determination of metals (K, Na, Ca, Cu, Zn, Mg, Mn, Al, Fe, Cd, Pb, Ni, Cr, Sn) by flame AAS	SOP No. 14 (EBC 9.13.3, 9.14.3, 9.16, 9.17, 9.18, 9.19, 9.20)	Beer, sweet wort, wort, non-alcoholic and low-alcohol beverages, drinking water
17	Determination of metals (Ca, Al, Fe) by flame AAS	SOP No. 14A (MEBAK (1998) 1.1.1.4.2., 1.1.1.5.2 and 1.1.1.6)	Kieselguhr, perlite
18	Determination of Hg by mercury analyzer	SOP No. 15 (manual for mercury analyzer)	Beer, malt, sweet wort, wort, hop and hop products, cereals, beverages

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Ordinal number <sup>1</sup>	Test procedure/method name	Test procedure/method identification <sup>2</sup>	Test object
19	Determination of lower aliphatic halohydrocarbons by GC-ECD and their sum by calculation from measured values <sup>8</sup>	SOP No. 16 (EPA 601)	Beer, non-alcoholic and low-alcoholic beverages
20	Determination of thiobarbituric acid (TBA) number by spectrophotometry	SOP No. 17 (MEBAK 2.4)	Sweet wort, wort, beer
21	Determination of total polyphenols by spectrophotometry	SOP No. 18 (EBC 9.11)	Beer
22	Determination of tetrahydroiso- $\alpha$ acids by HPLC-UV	SOP No. 19 (De Cooman, L. et al. (2000) J. Inst. Brew. 106(3), 169-178)	Beer
23	Determination of saccharides by HPLC - RI	SOP No. 20 (Jurková J. et al. (2014) Food Anal. Methods, 7(8), 1677) <sup>3</sup>	Sweet wort, wort, beer, mixed beer, beercoolers, malt beverages, non-alcoholic beverages, syrups
24	Determination of total nitrogen by Kjeldahl	SOP No. 21 (EBC 8.9.1, 9.9.1)	Sweet wort, wort, beer
25	Determination of coagulable nitrogenous compounds by boiling by Kjeldahl	SOP No. 21A (PSA 6.8.2)	Wort, beer
26	Determination of final attenuation	SOP No. 22 (EBC 8.6.1, 9.7)	Wort, beer
27	Reserved		
28	Determination of dimethylsulphide and its precursors by GC-FID	SOP No. 24 (EBC 9.39)	Wort, beer
29	Sensory test	SOP No. 25 ČSN 56 0186-2; ČSN EN ISO 5495; ČSN ISO 8587; ČSN EN ISO 4120	Beer, beer mixed drinks
30	Determination of pesticide residues by LC-MS <sup>8</sup>	SOP No. 26 Dušek et al. (2018) J. Inst. Brew. 124, 222) <sup>4</sup>	Hop and hop products (SANTE/12682/2019)

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Ordinal number <sup>1</sup>	Test procedure/method name	Test procedure/method identification <sup>2</sup>	Test object
31	Determination of pesticide residues by LC-MS <sup>8</sup>	SOP No. 27 (Dušek et al. (2019) J. Agric. Food Chem. 66, 10113-10121) <sup>5</sup>	Beer, cider, beer mixed drinks
32	Determination of melamine by GC-MS	SOP No. 28 (Cai et al. (2008) – Application notes; Zhao et al. (2013) - Application notes)	Beer, beer mixed drinks
33	Determination of Polycyclic Aromatic Hydrocarbons by HPLC-FLD <sup>8</sup>	SOP No. 31 (Horák et al. (1999) Kvasný průmysl 45,190-192) <sup>6</sup>	Beer, beer based alcoholic beverages, wine, non-alcoholic beverages
34	Determination of biogenic amines by HPLC-FLD <sup>8</sup>	SOP No. 29 (Zušťáková et al.: Kvasný, speciální číslo, 71 -75 (2019))	Beer, alcoholic beverages
35	Determination of metals by ICP-MS <sup>8</sup>	SOP No. 30A (Analysis of Food and Agricultural Samples Using PlasmaQuant®MS, Analytik Jena)	Drinking water, beer, cider, soft drink, wort
36	Determination of metals by ICP-MS <sup>8</sup>	SOP No. 30B (Analysis of Food and Agricultural Samples Using PlasmaQuant®MS, Analytik Jena, Anton Paar – application sheet) <sup>7</sup>	Cereals, hops, hop products, yeast
37	Determination of Polycyclic Aromatic Hydrocarbons by HPLC-FLD <sup>8</sup>	SOP No. 32 (Anastassiades et al.; J. AOAC Int. 2003, 86, 412-431, EPA 8310 PAH Mix on Pinnacle® II PAH – application sheet)	Cereals

<sup>1</sup> asterisk at the ordinal number identifies the tests, which the Laboratory is qualified to carry out outside the permanent laboratory premises

<sup>2</sup> 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 edition of the specified procedure is used (including any changes)

<sup>3</sup> DOI 10.1007/s12161-014-9805-y

<sup>4</sup> DOI 10.1002/jib.490

<sup>5</sup> DOI: 10.1021/acs.jafc.8b03416

<sup>6</sup> DOI: 10.18832/kp1999015

<sup>7</sup> Digestion of Food and Other Organic Samples in Multiwave GO

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<sup>8</sup> Analytes:

*SOP No. 9:* NDMA – N-nitrosodimethylamine; NDEA – N-nitrosodiethylamine, NDBA – N-nitrosodibutylamine, NPIP – N-nitrosopiperidine, NPYR – N-nitrosopyrrolidine, NMOR – N-nitrosomorpholine,

*SOP No 9A:* NDMA – N-nitrosodimethylamine; NDEA – N-nitrosodiethylamine, NDBA – N-nitrosodibutylamine, NPIP – N-nitrosopiperidine, NPYR – N-nitrosopyrrolidine, NMOR – N-nitrosomorpholine

*SOP No 9B:* NDMA – N-nitrosodimethylamine; NDEA – N-nitrosodiethylamine, NDPA – N-nitrosodipropylamine, NDBA – N-nitrosodibutylamine, NPIP – N-nitrosopiperidine, NPYR – N-nitrosopyrrolidine, NMOR – N-nitrosomorpholine

*SOP No 16:* dichloromethane, 1,1-dichloroethane, 1,2-dichloroethane, trichloromethane, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,1,2-trichloroethene, 1,1,2,2-tetrachloroethene, tetrachloromethane, 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane

*SOP No 26:* Acephat, Acetamiprid, Avamectin B1A, Azoxystrobin, Bifenthrin, Boscalid, Carbendazim, Chlorpyrifos, Clothianidin, Cyazofamid, Cymoxanil, Dimethomorph (sum of isomers), Etoxazole, Fenpyroximate, Flonicamid, Hexythiazox, Imazalil, Imidacloprid, Malaoxon, Malathion (sum of Malathion and Malaoxon expressed as Malathion), Mandipropamid, Mepanipyrim, Metalaxyl, Myclobutanil, Dibrom/Naled, Oxadiazon, Penconazol, Pendimethalin, Pirimicarb, Propamocarb, Propargite, Propiconazole, Pymetrozin, Pyraclostrobin, Pyridaben, Quinoxifen, Spirodiclofen, Spirotetramat, Spiroxamine, Tebuconazole, Tebufenpyrad, Thiabendazole, Thiamethoxam, Triadimefon, Triadimenol, Trifloxystrobin and Triflumizole

*SOP No 27:* Acephate, Acetamiprid, Ametoctradin, Avamectin B1A, Azoxystrobin, Bifenthrin, Boscalid, Bupirimate, Carbendazim, Chlorpyrifos, Chlorantraniliprole, Clothianidin, Cymoxanil, Dimethomorph, Etoxazole, Fenarimol, Fenpropimorph, Fenpyroximate, Flonicamid, Hexythiazox, Imazalil, Imidacloprid, Indoxacarb, Mandipropamid, Mepanipyrim, Metalaxyl, Methoxyfenozid, Metrafenone, Myclobutanil, Oxadiazon, Penconazol, Pendimethalin, Pirimicarb, Propamocarb, Propargite, Propiconazole, Pymetrozin, Pyraclostrobin, Pyridaben, Quinoxifen, Spiroxamine, Tebuconazole, Tebufenozide, Tebufenpyrad, Thiabendazole, Thiacloprid, Thiamethoxam, Triadimefon, Triadimenol, Trifloxystrobin and Triflumizole

*SOP No 29* Histamine, tyramine

*SOP No 30A* Sn, Al, Cr, Cd, Co, Mn, Cu, Mo, Ni, Pb, Se, Zn, Fe

*SOP No 30B* Sn, Al, Cr, Cd, Co, Mn, Cu, Mo, Ni, Pb, Se, Zn, Fe

*SOP No 31:* benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene and dibenzo[a,h]anthracene

*SOP No. 32:* Anthracene, Benzo[a]anthracene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[g,h,i]perylene, Benzo[a]pyrene, Chrysene, Dibenz[a,h]anthracene, Fluorene, Indeno[1,2,3-cd]pyrene, Phenanthrene, Pyrene

Annex:

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Flexible scope of accreditation

Ordinal number of tests
2, 3, 5 - 7, 9 - 11, 16, 17, 19, 23, 24, 29, 30, 34 - 37

The laboratory is allowed to modify the test methods in the Annex within the specified scope of accreditation. The flexible approach to the scope of accreditation cannot be applied to the tests not included in the Annex.

**Explanations:**

document SANTE/12682/2019: Guidance document on analytical quality control and method validation

ATNC – Apparent Total N–Nitrosocompounds

BRFI – Brewing Research Foundation Institute (currently BIRF – Brewing Industry Research Foundation)

EBC – European Brewery Convention Analysis Committee: Analytica-EBC, Verlag Hans Carl Getränke- Fachverlag, Nürnberg, 2009.

ECD – Electron Capture Detector

FLD – Fluorescence Detector

HPLC – High Performance Liquid Chromatography

GC-MS – Gas Chromatography – Mass Spectroscopy

ICP-MS – Inductively Coupled Plasma Mass Spectrometer

LC – MS – Liquid Chromatography – Mass Spectroscopy

MEBAK – Methodensammlung der Mitteleuropäischen Brautechnischen Analysenkommission. MEBAK, Weihenstephan-Freising, Germany, 2012.

NIBEM – name of equipment (Haffmans product) – method NIBEM“ – decrease of foam during the time is monitored using an electrode

NIOSH – National Institute for Occupational Safety and Health

PSA – Brewing and Malting: Basařová et al., Merkanta, 1992.

RI – Refractometric Detector

SOP – Standard Operating Procedure

TEA – Chemiluminescence Detector