DAP Deutsches Akkreditierungssystem Prüfwesen GmbH

Annex to the Accreditation Certificate DAP-PL-3502.00
Accreditation based on DIN EN ISO/IEC 17025:2005

Period of Validity: 2008-06-30 to 2012-05-27

Holder of the Certificate: **Hydroisotop GmbH**

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Tests in the field: **Isotope analyses of water, gas and selected food;
analyses of selected radio nuclides dissolved in water by gamma spectrometry;
physical, physical-chemical, and chemical analyses of water;
chemical analyses of drinking water according to annex 2 and 3 of Drinking Water Ordinance: 2001;
sampling of raw and drinking water, of water from ground water aquifers and flowing waters**

Abbreviations used: see last page

1 Isotope analyses of water, gas and selected food

QMA 504-2/1 2002-04	Analyses of Tritium (^{3}H) in water after electrolytic enrichment by Liquid Scintillation Counting (LSC)
QMA 504-2/2 2002-04	Analyses of hydrogen isotope ratio ($^{2}H/^{1}H$) in water by isotope ratio mass spectrometry (IRMS)
QMA 504-2/3 2002-04	Analyses of oxygen isotope ratio ($^{18}O/^{16}O$) in water, juice, wine, and juice concentrates by isotope ratio mass spectrometry (IRMS)
QMA 504-2/4 2002-04	Analyses of hydrogen isotope ratio ($^{2}H/^{1}H$) of volatile hydrocarbon compounds in water by isotope ratio mass spectrometry (IRMS)
QMA 504-2/5 2002-04	Analyses of carbon isotope ratio ($^{13}C/^{12}C$) of volatile hydrocarbon compounds in water by isotope ratio mass spectrometry (IRMS)
QMA 504-2/6 2002-04	Analyses of carbon isotope ratio ($^{13}C/^{12}C$) of CO_2 dissolved in water (DIC) by isotope ratio mass spectrometry (IRMS)
QMA 504-2/7 2002-04	Analyses of nitrogen isotope ratio ($^{15}N/^{14}N$) in nitrate (NO_3^-) dissolved in water by isotope ratio mass spectrometry (IRMS)

QMA 504-2/8 2002-04	Analyses of nitrogen isotope ratio ($^{15}N/^{14}N$) of volatile nitrogen (N_2) dissolved in water by isotope ratio mass spectrometry (IRMS)
QMA 504-2/9 2002-04	Analyses of oxygen isotope ratio ($^{18}O/^{16}O$) in nitrate (NO_3^-) dissolved in water by isotope ratio mass spectrometry (IRMS)
QMA 504-2/10 2002-04	Analyses of carbon-14 isotope (^{14}C) in inorganic carbon dissolved in water (DIC; dissolved inorganic carbon) by Liquid Scintillation Counting (LSC)
QMA504-2/16 2003-11	Analyses of carbon isotope ratio ($^{13}C/^{12}C$) of highly volatile chlorinated hydrocarbons Tetrachlorethene (PCE), Trichlorethene (TCE), and cis-1,2-Dichlorethene (cDCE) in water samples by gas chromatography isotope ratio mass spectrometry (GC-IRMS)

2 Analyses of specific radio nuclides dissolved in water by gamma spectrometry

QMA504-2/17 2004-03	Analyses of activity concentration of the radio nuclide Radon-222 dissolved in water by gamma spectrometry after extractive enrichment (gas extraction) on activated charcoal
QMA504-2/18 2004-03	Analyses of activity concentration of the radio nuclides Radium-226 and Radium-228 dissolved in water by gamma spectrometry

3 Analyses of gas mixtures

QMA 504-2/15 2002-04	Analyses of the composition of gas mixtures by gas chromatography

4 Analysis of water

4.1 Sampling of water from aquifers and flowing waters

DIN EN ISO 5667-1 (A 4) 2007-04	Water quality - Sampling - Part 1: Guidance on the design of sampling programmes and sampling techniques
DIN 38402 (A 12) 1985-06	Sampling from barrages and lakes
DIN 38402 (A 13) 1985-12	Sampling from aquifers
DIN 38402 (A 15) 1986-07	Sampling from rivers and streams
DIN EN ISO 5667-3 (A 21) 2004-05	Water quality - Sampling - Part 3: Guidance on the preservation and handling of samples

LAWA AQS-Merkblatt P-8/2 1995-05	Sampling from aquifers

4.2 Physical and physical-chemical characteristics

DIN EN ISO 7887 (C 1) 1994-12	Water quality - Examination and determination of colour (deviation: *visual testing*)
DIN EN ISO 7027 (C 2) 2000-04	Water quality - Determination of turbidity (deviation: *visual testing*)
DIN 38404 (C 4) 1976-12	Determination of temperature
DIN 38404 (C 5) 1984-01	Determination of the pH-value
DIN 38404 (C 6) 1984-05	Determination of the oxidation-reduction potential, O. R. P.
DIN EN 27888 (C 8) 1993-11	Water quality; determination of electrical conductivity

4.3 Anions

DIN 38405 (D 4) 1985-07	Determination of fluoride
DIN EN 26777 (D 10) 1993-04	Water quality; determination of nitrite; molecular absorption spectrometric method
DIN EN ISO 10304-1 (D 19) 1995-04	Water quality - Determination of dissolved fluoride, chloride, nitrite, orthophosphate, bromide, nitrate, sulfate ions, using liquid chromatography of ions - Part 1: (deviation: *additionally jodide, acetate and thiosulphate, without nitrite*)

4.4 Cations

DIN 38406 (E 1) 1983-05	Determination of iron
DIN 38406 (E 2) 1983-05	Determination of manganese
DIN 38406 (E 5) 1983-10	Determination of ammonia-nitrogen
DIN EN ISO 14911 (E 34) 1999-12	Water quality - Determination of dissolved Li^+, Na^+, NH_4^+, K^+, Mn^{2+}, Ca^{2+}, Mg^{2+}, Sr^{2+} and Ba^{2+} using ion chromatography - Method for water and waste water (deviation: *just Na^+, K^+, Ca^{2+}, Mg^{2+}, Li^+*)

4.5 Parameters characterising effects and substances

DIN 38409 (H 1) 1987-01	Determination of the total solids residue, the filtrate solids residue and the residue on ignition
DIN EN 1484 (H 3) 1997-08	Water analysis - Guidelines for the determination of total organic carbon (TOC) and dissolved organic carbon (DOC)
DIN 38409 (H 7) 2004-03	Determination of acid and base capacity

4.6 Jointly determinable substances

DIN 38407 (F 3) 1998-7	Determination of polychlorinated biphenyls
DIN EN ISO 10301 (F 4) 1997-08	Water quality - Determination of highly volatile halogenated hydrocarbons - Gas-chromatographic methods
DIN 38407 (F 9) 1991-05	Determination of benzene and some of its derivatives by gas chromatography
DIN EN ISO 11369 (F 12) 1997-11	Water quality - Determination of selected plant treatment agents - Method using high performance liquid chromatography with UV detection after solid-liquid extraction
DIN EN ISO 17993 (F 18) 2004-03	Water quality - Determination of 15 polycyclic aromatic hydrocarbons (PAH) in water by HPLC with fluorescence detection after liquid-liquid extraction

4.7 Gaseous matters

DIN EN 25814 (G 22) 1992-11	Water quality; determination of dissolved oxygen; by the electrochemical probe method

4.8 Selected rapid tests

QMA 504-2/14 2002-04	Photometric analyses of nitrite (NO_2^-) in water using „Merck Spectroquant 1.14776.0001“
QMA 504-2/11 2002-04	Photometric analyses of iron total ($Fe_{tot.}$) in water using „Merck Spectroquant 1.14761.0001“
QMA 504-2/12 2002-04	Photometric analyses of manganese total (Mn_{tot}) in water using „Merck Spectroquant 1.14770.0001“
QMA 504-2/13 2002-04	Photometric analyses of ammonia (NH_4^+) in water using „Merck Spectroquant 1.14752.0001“

5 Analysis of drinking water according to German Drinking Water Ordinance:2001*

5.1 Sampling

DIN EN ISO 5667-1 (A 4) 2007-04	Water quality - Sampling - Part 1: Guidance on the design of sampling programmes and sampling techniques
DIN 38402 (A 12) 1985-06	Sampling from barrages and lakes
DIN 38402 (A 13) 1985-12	Sampling from aquifers
DIN 38402 (A 14) 1986-03	Sampling of untreated water and drinking water
DIN 38402 (A 15) 1986-07	Sampling from rivers and streams
DIN 38402 (A 18) 1991-05	Sampling of water from mineral and medicinal springs
DIN EN ISO 5667-3 (A 21) 2004-05	Water quality - Sampling - Part 3: Guidance on the preservation and handling of samples
LAWA AQS-Merkblatt P-8/2 1995-05	Sampling from aquifers

5.2 Chemical parameters in annex 2 (part I)

DIN 38407 (F 9) 1991-05	Determination of benzene and some of its derivatives by gas chromatography
DIN EN ISO 10301 (F 4) 1997-08	Water quality - Determination of highly volatile halogenated hydrocarbons – Gas chromatographic methods
DIN EN ISO 10304-1 (D 19) 1995-04	Water quality - Determination of dissolved anions by liquid chromatography of ions - Part 1: Determination of bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulphate *(here: F^- und and NO_3^-)*
DIN 38405 (D 4) 1985-07	Determination of fluoride
DIN EN ISO 11369 (F 12) 1997-11	Water quality - Determination of selected plant treatment agents - Method using high performance liquid chromatography with UV detection after solid-liquid extraction

** According to the requirements of the legislator, this accreditation does not replace the recognition or approval procedure of the responsible authority.*

5.3 Chemical parameters in annex 2 (part II)

DIN EN ISO 17993 (F 18) 2004-03	Water quality - Determination of 15 polycyclic aromatic hydrocarbons (PAH) in water by HPLC with fluorescence detection after liquid-liquid extraction
QMA 504-2/14 2002-04	Photometric analyses of nitrite (NO_2^-) in water using „Merck Spectroquant 1.14776.0001“
DIN EN ISO 10301 (F 4) 1997-08	Water quality - Determination of highly volatile halogenated hydrocarbons - Gas-chromatographic methods

5.4 Chemical parameters in annex 3

QMA 504-2/13 2002-04	Photometric analyses of ammonia (NH_4^+) in water using „Merck Spectroquant 1.14752.0001“
DIN EN ISO 10304-1 (D 19) 1995-04	Water quality - Determination of dissolved fluoride, chloride, nitrite, orthophosphate, bromide, nitrate, sulfate ions, using liquid chromatography of ions - Part 1: Method for water with low contamination *(here chloride and sulphate)*
QMA 504-2/11 2002-04	Photometric analyses of iron total ($Fe_{tot.}$) in water using „Merck Spectroquant 1.14761.0001“
DIN EN ISO 7887 (C 1) 1994-12	Water quality - Examination and determination of colour *(deviation: visual testing)*
DEV B 1/2 1971	Testing of smell and taste
DIN EN 27888 (C 8) 1993-11	Water quality; determination of electrical conductivity
QMA 504-2/12 2002-04	Photometric analyses of manganese total (Mn_{tot}) in water using „Merck Spectroquant 1.14770.0001“
DIN EN ISO 14911 (E 34) 1999-12	Water quality - Determination of dissolved Li^+, Na^+, NH_4^+, K^+, Mn^{2+}, Ca^{2+}, Mg^{2+}, Sr^{2+} and Ba^{2+} using ion chromatography - Method for water and waste water
DIN EN ISO 1484 (H 3) 1997-08	Water analysis - Guidelines for the determination of total organic carbon (TOC) and dissolved organic carbon (DOC)
DIN EN ISO 7027 (C 2) 2000-04	Water quality - Determination of turbidity *(deviation: visual testing)*
DIN 38404 (C 5) 1984-01	Determination of the pH-value

5.5 Radiological parameters in annex 3

DIN 38404 (C 13) 1988-05	Determination of tritium *(deviation: electrolytic enrichment)*
QMA 504-2/19 2007-03	Determination of total dose according to Drinking Water Ordinance: 2001 based on the radio nuclide contents of water samples

5.6 Additional chemical parameters according § 14 Abs. 1

DIN 38409 (H 7) 2004-03	Determination of acid and base capacity

Abbreviations used:

DEV	German institutional method
DIN	German institute for standardisation
EN	European Norm
ISO	International Organisation for Standardisation
LAWA	Working group of the federal states on water
QMA	In-house method
StrSchV	Radiation protection ordinance