HIDEX

Standards for LSC

Unquenched standard sets for ^{3}H and ^{14}C

Alpha/Beta OQ set

Quenched standard sets for ^{3}H and ^{14}C

Internal LSC standards for beta and alpha counting in aqueous and organic solvents. The available nuclides include ^{3}H, ^{14}C, ^{90}Sr, ^{226}Ra, ^{210}Pb and ^{241}Am

Low background *dead water*

LSC Standard Sets

The standard LSC sets are manufactured for Hidex by Eckert & Ziegler. They are prepared gravimetrically from NIST traceable solutions. After preparation, all standards are QC tested with calibrated counting system of Eckert & Ziegler. Uncertainties are estimated using the guidance in NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results".

Standard sets are not classified as radioactive material in transportation.

Unquenched LSC Standard Sets

For verification of instrument performance.

A set contains ^{3}H, ^{14}C, and a background sample. All samples contain toluene based scintillator. Standards are available in 20 ml or 7 ml Argon purged, flame sealed borosilicate glass LSC vials.

462-307 Unquenched Standard Set, C-14 / H-3 / bkg, 7 ml vials, 5 ml vol

Suggested for Triathler LSC & MLT performance assesment
Not compliant with 300 SL or 600 SL
1,67 kBq ^{14}C +/-20 % (100 000 dpm)
4,17 kBq ^{3}H +/-20 % (250 000 dpm)
Total activity: 5.84 kBq
NIST traceable, provided with certificate
Expiration date: 5 years from the date of preparation

462-320 Unquenched Standard Set, C-14 / H-3 / bkg, 20 ml vials, 10 ml vol

Suggested for 300 SL & 600 SL performance assessment
1,1 kBq ^{14}C +/-20 % (66 000 dpm)
2,9 kBq ^{3}H +/-20 % (174 000 dpm)
Total activity: 4.0 kBq
NIST traceable, provided with certificate
Expiration date: 5 years from the date of preparation

Alpha/Beta LSC standard set

For alpha/beta calibration and alpha/beta OQ.

A set contains ^{226}Ra and a background sample. Both samples contain DIN based LSC cocktail. Standards are available in 20 ml Argon purged, flame sealed borosilicate glass LSC vials.

462-226 Alpha/Beta OQ set, Ra-226 / bkg, 20 ml vials, 15 ml vol

3 Bq ^{226}Ra +/- 15 %
Total activity: 3 Bq
NIST traceable, provided with certificate
Expiration date: 3 years from the date of preparation

Quenched LSC Standard Sets

For method calibration by creating an external standard - or TDCR quench curve.

Quenched sets are available in Argon purged flame sealed borosilicate glass LSC vials. Each set contains 10 pcs of 20 ml vials of either ^{3}H or ^{14}C standard samples with constant level of activity and variable level of quenching. The quench sets are available either in toluene or in di-isopropyl naphthalene (DIN) solvent. Sample volume is 15 ml.

462-8303 H-3 Quenched Standard Set in Toluene, 10 x 20 ml vials

4.17 kBq ^{3}H +/- 20 % (250 000 dpm)
Total activity per set 41,7 kBq
NIST traceable, provided with certificate
Expiration date: 3 years from the date of preparation

462-7303 H-3 Quenched Standard Set in DIN, 10 x 20 ml vials

4.17 kBq ^{3}H +/- 20 % (250 000 dpm)
Total activity per set 41,7 kBq
NIST traceable, provided with certificate
Expiration date: 3 years from the date of preparation

462-8314 C-14 Quenched Standard Set in Toluene, 10 x 20 ml vials

1,67 kBq C-14 +/- 20 % (100 000 dpm)
Total activity per set 16,7 kBq
NIST traceable, provided with certificate
Expiration date: 3 years from the date of preparation

462-7314 C-14 Quenched Standard Set in DIN, 10 x 20 ml vials

1,67 kBq C-14 +/- 20 % (100 000 dpm)
Total activity per set 16,7 kBq
NIST traceable, provided with certificate
Expiration date: 3 years from the date of preparation

Internal LSC Standards

For self-made reference samples.

Hidex supplies a range of internal standards with known activity. Standards are delivered in flame-sealed glass ampoules. ^{3}H and ^{14}C standards are prepared for Hidex by Eckert & Ziegler and radionuclide calibration and purification is checked by Eckert & Ziegler. ^{90}Sr, ^{210}Pb, ^{241}Am and ^{226}Ra standards are manufactured for Hidex by a Czech partner. Radionuclide calibration and purification is checked by Czech Metrology Institute, and traceability to the Czech National Standard of Activity of Radionuclides is maintained.

H-3 Internal standards

462-006 H-3 in water, 10 ml, 400 kBq

Total activity: 400 kBq
Measurement uncertainty: < 3,5 %
Activity tolerance: +/- 20 %
Volume: 10 ml in flame-sealed glass ampoule
Media: water
NIST traceable, provided with certificate

462-8003G H-3 labelled glucose in water, 10 mL, 100 kBq

Suitable for 600OX Oxidizer use
Total activity: 100 kBq
Measurement uncertainty: < 3,5 %
Activity tolerance: +/- 20 %
Volume: 10 ml in flame-sealed glass ampoule
Media: 50 µg/g glucose and 1 mg/g formaldehyde in water
NIST traceable, provided with certificate

462-8003G_s H-3 labelled glucose in water, 0,5 ml, 5 kBq

Suitable for 600OX Oxidizer use
Total activity: 5 kBq
Measurement uncertainty: < 3,5 %
Activity tolerance: +/- 20 %
Volume: 0,5 ml in 1,5 ml microtube, transfer from glass ampoule is made by Hidex
Media: 50 µg/g glucose and 1mg/g formaldehyde in water

C-14 Internal standards

462-044 C-14 labelled toluene in toluene, 10 ml, 100 kBq

Total activity: 100 kBq
Measurement uncertainty: < 4 %
Activity tolerance: +/- 20 %
Volume: 10 ml in flame sealed glass ampoule
Media: toluene
NIST traceable, provided with certificate

462-045 C-14 labelled Sodium carbonate in NaOH, 10 ml, 100 kBq

Total activity: 100 kBq
Measurement uncertainty: < 4 %
Activity Tolerance: +/- 20 %
Volume: 10 ml in flame sealed glass ampoule
Media: 30 µg/g C as Na2CO3 in 0.1 M NaOH solution
NIST traceable, provided with certificate

462-8014_s C-14 labelled glucose in water, 0,5 ml, 5 kBq

Suitable for 600OX Oxidizer use
Total activity: 5 kBq
Measurement uncertainty: < 4 %
Activity Tolerance: +/- 20 %
Volume: 0,5 ml in 1,5 ml microtube, transfer from glass ampoule is made by Hidex
Media: 50 µg/g glucose and 1 mg/g formaldehyde in water

462-8014 C-14 labelled glucose in water, 10 mL, 100 kBq

Suitable for 600OX Oxidizer use
Total activity: 100 kBq
Measurement uncertainty: < 4 %
Activity Tolerance: +/- 20 %
Volume: 10 mL in flame-sealed glass ampoule
Media: 50 µg/g glucose and 1 mg/g formaldehyde in water
NIST traceable, provided with certificate

Standards for other nuclides

462-046 Sr-90 Nitrate in HNO3 solution, 1 ml, 1 kBq

Total activity: 1 kBq ^{90}Sr in equilibrium with progeny
Volume: 1 mL in flame sealed ampoule
Media: 20 mg/l Sr(NO3)2 + 20 mg/l Y(NO3)3 + 3 g/l HNO3
Traceable to Czech national standard, provided with certificate

462-048 Pb-210 Nitrate in HNO3, 1 mL, 1 kBq

Total activity: 1 kBq ^{210}Pb in equilibrium with progeny
Volume: 1 ml in flame sealed ampoule
Media: Pb-nitrate 20 mg/L + Bi-nitrate 20 mg/L + TeO2 25 mg/ L + HNO3 63g/L.
Traceable to Czech national standard, provided with certificate

462-050 Am-241 Nitrate in HNO3 solution, 1 mL, 1 kBq

Total activity: 1 kBq
Volume: 1 mL in flame sealed ampoule
Media: 20 mg/l Sm(NO3)3 + 6,3 g/l HNO3
Traceable to Czech national standard, provided with certificate

462-052 Ra-226 in HCl solution, 1 ml, 370 Bq

Total activity: 370 Bq
Volume: 1 ml in flame sealed glass ampoule
Media: 1 g/l BaCl2 + 10 g/l HCl in distilled water
Traceable to Czech national standard, provided with certificate

^{90}Sr, ^{210}Pb and ^{241}Am standards are also available on request as NIST traceable, manufactured by Eckert & Ziegler. Lead time for these standards is about 2 months.

462-049 Sr-90 Chloride in HCl solution, 1 ml, 1 kBq

Total activity: 1 kBq ^{90}Sr is in equilibrium with progeny
Measurement uncertainty: < 2 %
Activity Tolerance: +/- 20 %
Volume: 1 ml in flame sealed ampoule
Media: 30 µg/g Sr + 30 µg/g Y + 0,1 M HCl
NIST traceable, provided with certificate

462-050 Am-241 Chloride in HCl solution, 1 ml, 1 kBq

Total activity: 1 kBq
Measurement uncertainty: < 2 %
Activity Tolerance: +/- 20 %
Volume: 1 ml in flame sealed ampoule
Media: Americium Chloride in 1 M HCl, no carrier added
NIST traceable, provided with certificate

462-051 Pb-210 Nitrate in HNO3, 1 ml, 1 kBq

Total activity: 1 kBq ^{210}Pb in equilibrium with progeny
Measurement uncertainty: < 2 %
Activity Tolerance: +/- 20 %
Volume: 1 ml in flame sealed ampoule
Media: Lead Nitrate in 1 M HNO3.
NIST traceable, provided with certificate

Low Background Water (dead water)

Manufactured for Hidex by Eckert & Ziegler, this low background water originates from a deep source that has not been in contact with atmosphere, thus having minimal possible activity concentration. The certificate provided along with each bottle contains analysis report with upper limit for ^{3}H activity.

462-004 Low background water (Dead water), 1 L, H-3 < 0,012 Bq/kg

Non-distilled
^{3}H activity < 0.012 Bq/kg
Provided with certificate