

HIDEX



Standards for LSC

Version
20.12.2021

Standards for LSC

Hidex provides

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

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

Low background *dead water*.

The unquenched and quenched standard 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".

The radioactivity levels of the ^3H and ^{14}C components of these standards are far below the threshold levels specified in the International Air Transportation Administration (IATA) regulations pertaining to Dangerous Goods and are therefore not classified as radioactive material in transportation. The deliveries include QA test certificate and MSDS.



Unquenched LSC Standard Set of ^3H , ^{14}C and Blank

A set contains ^3H , ^{14}C , and a background sample. Standards are prepared gravimetrically from NIST traceable solutions and flame-sealed in glass ampoules. The set can be used for verification of instrument performance. Manufactured for Hidex by Eckert & Ziegler.

Cat. No. 462-307

Unquenched standard set for ^3H , ^{14}C and Blank for LCS calibration, 7 ml ampoules

*Contains toluene, UN 1294 for transportation

2.16 kBq C-14 +/-20% (130 000 dpm)

5 kBq H-3 +/-20% (300 000 dpm)

Total activity: 7.16 kBq

NIST traceable, provided with certificate.

Expiration date: 5 years from the date of preparation.

Compliant with Hidex Triathler LSC

Cat. No. 462-320

Unquenched standard set for ^3H , ^{14}C and Blank for LCS calibration, 20 ml ampoules, 10 ml volume

*Contains toluene, UN 1294 for transportation

1,1 kBq C-14 +/-20% (66 000 dpm)

2,9 kBq H-3 +/-20% (174 000 dpm)

Total activity: 4.0 kBq

NIST traceable, provided with certificate.

Expiration date: 5 years from the date of preparation.

Compliant with Hidex 300 SL and 600 SL



Quenched LSC Standard Set of ^3H and ^{14}C in DIN and toluene

Each set contains ten (10) pcs of 20 ml ampoules of either ^3H 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. Intended use is creating either External standard - or TDCR- quench curves. Sample volume 15 ml. Standards are prepared gravimetrically and flame-sealed in glass ampoules. Manufactured for Hidex by Eckert & Ziegler.

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| ^3H activity /vial: | 4.17 kBq H-3 +/- 20% (250,000 DPM) |
| ^3H total activity /set: | 41.7 kBq |
| ^{14}C activity/vial: | 1.67 kBq C-14 +/- 20% (100,000 DPM) |
| ^{14}C total activity/set: | 16.7 kBq |

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| Cat. No. 462-7303 | ^3H DIN Quenched Standard Set, 10 x 20 ml vials NIST traceable, provided with certificate |
| Cat. No. 462-7314 | ^{14}C DIN Quenched Standard Set, 10 x 20 ml vials NIST traceable, provided with certificate |
| Cat. No. 462-8303 | ^3H Toluene Quenched Standard Set, 10 x 20 ml vials *Contains toluene, UN 1294 for transportation NIST traceable, provided with certificate |
| Cat. No. 462-8314 | ^{14}C Toluene Quenched Standard Set, 10 x 20 ml vials *Contains toluene, UN 1294 for transportation NIST traceable, provided with certificate |



Internal LSC Standards

³H and ¹⁴C

To allow convenient, accurate quench correction, Hidex supplies a range of Internal Standard Kits of ³H and ¹⁴C with known activity (DPM). Standards are prepared gravimetrically and delivered in flame-sealed in glass ampoules. Manufactured for Hidex by Eckert & Ziegler. Radionuclide calibration and purification is checked by Eckert & Ziegler, and NIST traceability is maintained. Certificate is provided along with each standard.

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| Cat. No. 462-006 | H-3 in water 10 ml in 10 ml flame sealed ampoule Total activity 400 kBq +/- 3.5 % 40 kBq/g 2.4 x 10 ⁶ DPM/g NIST traceable, provided with certificate |
| Cat. No. 462-044 | C-14 in toluene, 10 ml in 10 ml flame sealed ampoule Total activity 100 kBq +/- 4 % 10 kBq/g 6x10 ⁵ DPM/g Contains toluene, UN 1294 for transportation NIST traceable, provided with certificate |
| Cat. No. 462-045 | C-14 Sodium carbonate in 0.1 M NaOH, 30 ug/g C carrier added, 10 ml in 10 ml flame sealed ampoule Total activity 100 kBq +/- 4 % 10 kBq/g 6x10 ⁵ DPM/g NIST traceable, provided with certificate |

Certified 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 H-3 activity.

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| Cat. No. 462-004 | Low background water (Dead water), 1000 ml bottle Non-distilled, H-3 activity < 0.012 Bq/kg Provided with certificate |
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Other nuclides

Hidex supplies $^{90}\text{Sr}+\text{Y}$, ^{226}Ra , $^{210}\text{Pb}+\text{Bi}+\text{Po}$ and ^{241}Am with known activity (DPM) in aqueous medium.

The radium standard is prepared gravimetrically and delivered in flame-sealed in glass ampoules. Manufactured for Hidex by Eckert & Ziegler. Radionuclide calibration and purification is checked by Eckert & Ziegler, and NIST traceability is maintained. Certificate is provided along with each standard.

Other standards are prepared gravimetrically and delivered in flame-sealed in glass ampoules. 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. Certificate is provided along with each standard.

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| Cat. No. 462-042 | Ra-226 Chloride in 0,1 M HCl, 30 ug/g Ba carrier added, 10 ml in 10 ml flame sealed ampoule Activity 1.2×10^4 DPM/g +/- 4.8 % (0.2 kBq/g, total 2 kBq) NIST traceable, provided with certificate |
| Cat. No. 462-046 | Sr-90 Nitrate in dilute HNO_3 , 1 mL in flame sealed ampoule. In equilibrium with Y-90. Includes Sr and Y carriers. Sr-nitrate 20 mg/L + Y-nitrate 20 mg/L + HNO_3 3 g/L. Activity: 1 kBq Sr-90. Certificate provided. Typical uncertainty 0,6%. |
| Cat. No. 462-047 | Am-241 Nitrate in dilute HNO_3 , 1 mL in flame sealed ampoule. Includes Sm carrier. Sm-nitrate 20 mg/L + HNO_3 6,3 g/L. Activity: 1 kBq. Certificate provided. Typical uncertainty 0,4%. |
| Cat. No. 462-048 | Pb-210 in HNO_3 , 1 mL in flame sealed ampoule. In equilibrium with progeny. Includes Pb, Bi and Te carriers. Pb-nitrate 20 mg/L + Bi-nitrate 20 mg/L + TeO_2 25 mg/L + HNO_3 63g/L. Activity: 1 kBq Pb-210. Certificate provided. Typical uncertainty 1,1%. |

The nuclides Sr-90 and Am-241 are also available on request as NIST traceable, in chloride solutions.