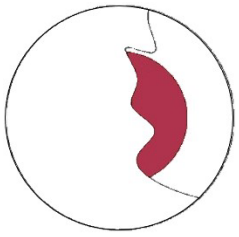
Geometry Reference Standards

Eckert & Ziegler

High resolution gamma-ray spectrometry is widely used for identifying and assaying gamma-ray emitting radionuclides in a wide range of sample types. To meet the requirements of quality management systems, the spectrometers should be calibrated using reference sources that are traceable to national standards. The reference sources should also match as closely as possible the geometry, density and composition of the sample to be assayed. Eckert & Ziegler offers a range of geometry reference sources to meet these requirements. Geometry References sources can be manufactured using a single nuclide or using one of our many multi-nuclide gamma mixtures.

Calibration

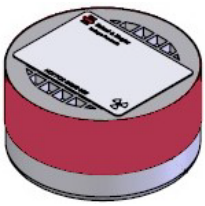
Geometry Reference Standards are prepared gravimetrically from calibrated solutions and then confirmed using a high purity germanium detector. This procedure ensures the highest possible quality with uncertainty values typically in the range of 3 - 4%, 95% relative expanded uncertainty (k=2). The standards are calibrated in our accredited measurement laboratories and are traceable to standards held by national metrology institutes world-wide.



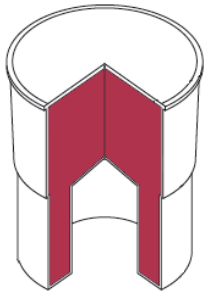
Filter Paper Standards

Filter paper standards are designed to closely match activity absorbed onto air filters and particulate filters. The radioactivity is uniformly distributed on the active area of filter media and covered with thin plastic foils or Mylar. Standards are available in sizes up to 50 mm (2 in.) or larger. Filter Paper Standards can be manufactured using Eckert & Ziegler's simulated filter material or using filter media provided by the customer. Filter paper standards can also be mounted on a disk, planchet or petri dish. Standards made from a composite or stack of multiple filters or made by compressing large format filters are also available.

Charcoal Cartridge Standards



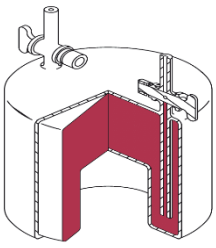
Charcoal and silver zeolite cartridge standards are manufactured in cartridges provided by the customer or in simulated cartridges provided by Eckert & Ziegler. According to customer specifications, the radioactivity is either face (surface) loaded or uniformly distributed. For face loaded cartridges, the radioactivity is either deposited onto a filter and placed under the screen of the cartridge or the radioactivity is distributed and sealed into the charcoal (or zeolite) to a depth of approximately 5 mm. For uniformly distributed, the radioactivity is distributed throughout the entire volume of charcoal (or zeolite) and sealed within the cartridge.



Matrix Standards

Matrix standards offer a convenient method to calibrate for the analysis of water, soil, environmental and other liquid or solid samples. The radioactivity is uniformly dispersed in a plastic resin or other matrix. The active matrix is then poured into a container (Marinelli beakers, bottles, jars, vials, etc.) and sealed. Customers should provide their sample containers to ensure the matrix standards closely matches their sample geometry. Eckert & Ziegler can provide a limited number of bottles and Marinelli beakers. A list of commonly used matrix materials is available on the back of this document.

Simulated Gas Standards



Simulated gas standards are prepared in customer supplied gas counting containers. These low-density (0.02 – 0.2 g/cm^3) standards have the same gamma-ray attenuation characteristics as actual gas standards in the range of 46.5 keV - 2.0 MeV and greatly extend the energy range and useful life of the calibration standard.

isotrak™

Selecting your Standard

Eckert & Ziegler manufactures Geometry Reference Standards in three ISO 17025 accredited laboratories as listed below. Refer to our Multi-Nuclide Gamma or Single Radionuclide brochures to build a standard most closely matching your sample type. We are continually developing matrices to address new applications, please contact us to discuss.

Standards	Eckert & Ziegler Isotope Products (7000 Series)	Eckert & Ziegler Analytics (8000 Series)	Eckert & Ziegler Nuclitec (NG Series)
Filter Paper Standards			
Single Filter	✓	✓	✓
Composite Filters		✓	✓
Compressed Filter		✓	
Charcoal Cartridge Standards			
Face Loaded with filter paper	✓	✓	✓
Face Loaded to 5 mm depth		✓	
Uniformly Distributed	✓	✓	✓
Simulated Gas			
1 atmosphere (0.02 g/cm^3)		✓	✓
10 atmospheres (0.1 g/cm^3)			✓
20 atmospheres (0.2 g/cm^3)			✓
Solid Resins			
Low Density (0.4 - 0.6 g/cm^3)	✓	✓	
Low Density (0.7 - 0.9 g/cm^3)	✓	✓	✓
Water Equivalent (0.97 - 1.17 g/cm^3)	✓	✓	✓
High Density (1.2 - 2.0 g/cm^3)	✓	✓	✓
High Density (2.1 - 3.0 g/cm^3)			✓
Other Matrices			
Simulated Vegetation (Vermiculite - 0.15 g/cm^3)		✓	
Simulated Vegetation (Corn Cob Grit - 0.44 g/cm^3)		✓	
Simulated Vegetation (Coffee Grounds - 0.6 g/cm^3)		✓	
Charcoal (0.5 - 0.6 g/cm^3)		✓	✓
Pulverized Soil (1.0 g/cm^3)		✓	
Sieved Soil (1.5 - 1.6 g/cm^3)		✓	
Sand (1.6-1.7 g/cm^3)	✓	✓	
Olivine (1.67 - 2.0 g/cm^3)		✓	
Concrete (1.1 – 1.5 g/cm^3)		✓	

Eckert & Ziegler Analytics, Inc.

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
USA

Tel: +1 404 352 8677
Email: isotrakusa@ezag.com
Web: www.ezag.com

Eckert & Ziegler Nuclitec GmbH

Gieselweg 1
38110 Braunschweig
Germany

Tel: +49 5307 932 555
Email: infoisotrak@ezag.com
Web: www.ezag.com

Eckert & Ziegler Isotope Products France

91940 Les Ulis
France

Tel: +33 1 64 86 22 22
Email: contact-fr@ezag.com
Web: www.ezag.com

Eckert & Ziegler Brazil Isotope Solutions

Rua Miguel Nelson Bechara, 480
Limão, São Paulo, SP, 02712-130
Brasil

Tel: +55 11 3526-5757
Email: contato@ezag.com
Web: www.ezagbrasil.com.br