Reference Standards

10 Critical Steps to World-Class Reference Standards

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RESTEK Pure Chromatography www.restek.com

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1 Review Customer & Method Requirements

To determine which organic reference standards we should develop as stock products, Restek experts closely monitor government regulations and methods from around the globe and also actively engage with our customers and distributors. Once a product is chosen based on regulatory changes, customer needs, and our 25+ years of experience, a veteran Restek chemist formulates a stable standard containing an ideal mix of compounds and concentrations. All formulations are then subjected to a thorough review of accuracy, compatibility, and solubility by a second chemist.

2 Verify Compatibility & Stability

All raw materials used in our reference standards are held to strict purity criteria, and compound compatibility is scrutinized during both formulation and review. We also conduct ongoing, long-term stability and short-term shipping stability studies in accordance with ISO 17034 and ISO Guide 35 to ensure reliability and accurate shelf-life reporting.

3 Characterize Raw Materials Thoroughly

Restek's Quality Control (QC) lab confirms the chemical identity and purity of mixture components and solvents using two or more of the following techniques: GC-FID, HPLC, GC-ECD, GC-MS, LC-MS, refractive index, and melting point.

4 Calibrate Analytical Balances

All analytical balances are verified at seven mass levels daily using NIST* traceable weights and are also calibrated yearly by an ISO/IEC 17025-accredited provider to guarantee accurate measurement.

5 Deactivate Glassware & Ampuls

Restek reference standards are prepared using Class A volumetric flasks and/or Class A pipettes. Ampuls and vials used in preparation and packaging are deactivated to prevent the loss of target analytes.

6 Maintain ISO Accreditation

The reference standard manufacturing and QC testing laboratories in Restek's state-of-the-art Bellefonte, PA, facility feature ISO 17034 and ISO/IEC 17025 accreditation. These accreditations—in addition to ISO 9001 registration, which we have maintained since 1994—serve as recognition that Restek and our labs meet the world-class quality standards established by the International Organization for Standardization (ISO). On-site manufacturing as well as raw material, qualitative, and quantitative analyses are completed in these ISO-accredited labs. *Restek's ISO-accredited labs offer a full line of both stock and custom CRMs.* Learn more at **www.restek.com/iso**

* National Institute of Standards and Technology

For more information, go to **www.restek.com/standards**

7 Offer a Variety of Documentation

Restek exclusively offers three levels of fully ISO-compliant documentation for our reference standards, and most stock standards come with Certificate of Analysis–Chromatographic Plus documentation.

Certificate of Analysis – Gravimetric includes all raw material information, lot numbers and purity, isomer ratios for isomeric compounds, and calculated concentration(s). Associated uncertainties are also included for certified reference materials (CRMs).

Certificate of Analysis – Chromatographic includes all raw material information, lot numbers and purity, isomer ratios for isomeric compounds, and calculated concentration(s). Associated uncertainties are also included for certified reference materials (CRMs). Additionally, a single sample is withdrawn from the packaged units and is tested via an appropriate technique to verify mixture composition. A chromatogram of the analyzed standard, with each peak identified, is included on the certificate.

Certificate of Analysis – Chromatographic Plus includes all raw material information, lot numbers and purity, isomer ratios for isomeric compounds, and calculated concentration(s). Associated uncertainties are also included for certified reference materials (CRMs). Additionally, a sample of the packaged units is analyzed in triplicate, and the peak areas are statistically compared to a second lot: either a previous lot (if available) or a freshly produced independent second lot. A chromatogram of the analyzed standard, with each peak identified, is included on the certificate. Plus, a detailed data pack containing the product certificate, all quantitative assay data and statistics, and the Reference Material Batch Record are available at **www.restek.com/documentation**

Documentation for all of your stock and custom Restek reference standards is a few clicks away at **www.restek.com/documentation**

8 Package Securely & Label Clearly

Every Restek standard is placed in compact, durable, and environmentally friendly packaging for dock-to-door protection. Provided notebook and vial labels provide critical storage, safety, and shelf-life information in an easy-to-read format for added safety and GHS compliance. QR codes on the ampul storage tube give you instant access to the certificate of analysis for *your* specific standard and lot # on Restek.com. Learn more about our recent packaging and labeling improvements at **www.restek.com/Standards2022**

9 Convenience and Safety Included with Each Ampul

As an added bonus, we include a deactivated screw-top vial (cat.# 24640) with each stock reference standard <5 mL for worry-free transfer. Every order also includes a free Restek Safe Cracker.

10 Manage Warehouse Inventory

To ensure the inventory is available when it's needed, Restek continually analyzes and maintains inventory of more than 1500 catalog standards and multiple lots of the most commonly requested calibration standards—as well as more than 4200 neat compounds. We pull inventory months before its expiration date to eliminate inadvertent delivery of expired or nearly expired reference standards.

For more information, go to **www.restek.com/standards**

Less Waiting and Lower Cost—
visit **www.restek.com/solutions** to immediately search our stock standards, then order or request a custom quote if needed!

What are Certified Reference Materials (CRMs)?

A CRM from Restek is in an exclusive subset of reference standards that meets the following set of strict criteria defined under ISO 17034 and ISO/IEC 17025:

- Made of raw materials characterized via qualified methods on qualified instruments.
- Produced in an ISO-accredited lab under documented procedures.
- Falls under the manufacturer's scopes of accreditation.

To learn more about Restek's ISO quality credentials and to view our certificates (including scopes of accreditation), visit **www.restek.com/iso**

Consolidate Orders with Restek

Along with both primary- *and* secondary-source reference standards, you can order all of your GC and LC columns, sample preparation supplies, accessories, and more from Restek!

www.restek.com

RESTEK
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Questions? Contact us or your local Restek representative (www.restek.com/contact-us).

www.restek.com

QUALITY ISO 9001 · 17025 · 17034

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