

# Certificate of Analysis

## Product Description:

Name: Trace Metals on Filter Media C  
Part number: QC-TMFM-C  
Lot number: SAMPLE  
Purity: 99.99% - 99.9999%

## Certified Values:

Element	( $\mu\text{g}/\text{filter}$ )	SRM ID	SRM Lot#	Element	( $\mu\text{g}/\text{filter}$ )	SRM ID	SRM Lot#
As	$100 \pm 10$	3103a	010713	Pb	$50.0 \pm 1.0$	3128	030721
Ba	$25.0 \pm 0.3$	*		Mn	$25.0 \pm 0.3$	3132	050429
Be	$25.0 \pm 0.3$	3105a	090514	Ni	$25.0 \pm 0.3$	3136	120619
Cd	$25.0 \pm 0.3$	3108	130116	Ag	$10.0 \pm 0.2$	3151	992212
Cr	$25.0 \pm 0.3$	3112a	030730	Tl	$25.0 \pm 0.5$	3158	993012
Co	$25.0 \pm 0.3$	3113	000630	V	$25.0 \pm 0.3$	3165	992706
Cu	$50.0 \pm 0.5$	3114	121207	Zn	$100 \pm 2$	3168a	120629
Fe	$50.0 \pm 0.5$	3126a	140812				

The certified concentration values are based on gravimetric measurements made during the production of the composite solution used to impregnate the filters and on measurements of the amount of stock solution deposited on the filter, and verified against SRM 3100 series developed by National Institute of Standards and Technology (NIST) via inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory developed method. The uncertainty in the certified value is calculated for a 95% confidence interval and coverage factor  $k$  is about 2.

\* Refer to Traceability Information, Section C.

## Preparation Information:

This certified reference material has been prepared from high-purity reference materials that were purchased from qualified vendors per ISO 9001:2008 guidelines and assayed by ICP-OES for conformity prior to use. The filters are designed to meet the QC requirements for Method 7300. The filter media is a mixed cellulose ester type that is 37 mm in diameter with a pore size of 0.8  $\mu\text{m}$ . Each filter is spiked with a composite standard solution containing the elements listed above.

Test solution preparation: The metals may not be uniformly distributed on the filter; therefore, the entire filter must be dissolved for an analysis. The filter is easily dissolved in 5 mL of 1:1  $\text{HNO}_3$  and diluted with 18 megaohm deionized water to the desired volume.

## Traceability Information:

The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties. The maintenance of the base and derived units of International System of Units (SI) with traceability of measurement results (contemporary metrology) to SI ensures their comparability over time as follows.

### a. Standard Weight and Analytical Balance

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High-Purity Standards is certified to ISO 9001:2008 and accredited to ISO/IEC 17025:2005 and ISO Guide 34:2009.

The standard weights (NBS weights Inventory No 20231A) are calibrated every two years by South Carolina Metrology Laboratory that is a participant in "NIST Weights and Measures Measurement Assurance Program" with a certificate of measurement traceability to NIST primary standards. The balances are calibrated yearly by the ISO 17025 accredited metrology service, and are verified weekly by an in-house method using standard weights.

b. **Volumetric Device**

The calibration of volumetric vessels is checked annually using the NBS 602 method.

c. **Thermometer**

The standard thermometers are calibrated every year by the ISO 17025 accredited metrology service. The thermometers used in-house are verified against the standard thermometers yearly.

d. **Calibration Standards:**

The Calibration Standards are traceable to SRM 3100 Series Spectrometric Standard Solutions or second sources.

**Packaging and Storage Conditions:**

The set includes ten spiked filters placed between individual spacers and packaged in a plastic petri dish. To maintain the integrity of this product, the filters should be stored in the petri dish under normal laboratory conditions.

**Refer to Material Safety Datasheet (MSDS) for hazardous information.**

**Expiration Information:**

The filters are guaranteed to be valid for twelve months from the shipping date provided. For this reason, standards from the same lot may have different expiration dates.

**Preparation Date:** May 15, 2015

**Shipped Date:**

**Expiration Date:**

**Certificate Issue Date:** May 15, 2015

**Quality Information:**



**ISO/IEC 17025:2005 Accreditation**  
**Certificate Number AT-1529**



**Angel Sellers**  
**Quality Manager**



**ISO Guide 34:2009 (RMP) Accreditation**  
**Certificate Number AR-1436**

NOTICE: HPS products are intended for laboratory use only. All products should be handled and used by trained professional personnel. The responsibility for the safe handling and use of these products rests solely with the buyer and/or user. The data and information as stated was furnished by the manufacturer of the product. The information provided in this certificate pertains only to the lot number specified. None of the information provided in this certificate may be used, reproduced or transmitted in any form or by any means without written approval from High Purity Standards.

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