

# Alpha Resources, LLC

## Certificate Of Analysis

AR 309  
CAST IRON STANDARD  
LOT # 516D

**% CARBON**  
MEAN = 3.65  
One Sigma Standard Deviation = +/- 0.03  
Expanded Uncertainty = +/- 0.06  
(k=2, @95% confidence. n=47)

**% SULFUR**  
MEAN = 0.0204  
One Sigma Standard Deviation = +/- 0.0009  
Expanded Uncertainty = +/- 0.0019  
(k=2.1, @95% confidence. n=47)

Method of Analysis is ASTM E 1019-11, and ARI 033

Primary (NMI) Standards Employed:

NIST	338, 4L, 16f
NCS	HC11003
Euro	481-1, 227-1, FB 12, FB 10-1, CKD230
JSS	111-12

The intended use of this standard is for the calibration and continued quality validation of Carbon and Sulfur in induction combustion, IR detection systems. The mean analytical values were derived data sets showing traceability to the above mentioned NMI standards, and reported in mass fraction. The analytical sample size was 0.3-0.5g nominal as suggested by the instrument manufacturer(s). The minimum sample size is subject to the ASTM test method and detection capability of your analyzer. The precision values represent the estimated uncertainty derived from the data sets and may not represent your testing capabilities. Refer to your test method for the expanded method derived uncertainty if needed. When necessary, professional judgment is applied toward consideration of data and statistical information. The statistical analysis and the overall direction and coordination of the analytical measurements leading to certification were performed by K.E. Dyer, Technical Manager, at Alpha Resources.

The material used in production of this standard was identified in accordance with ARI 032. The samples for round robin testing were selected in accordance with ARI 014. The above values relate only to the material used to produce this standard. This bottle contains 150g, cast iron powder, to be used directly from the bottle with no preparation needed. This standard has an indefinite shelf life. Keep sealed and store under normal laboratory conditions.

Remedies for any claimed defect in this product will be limited to product replacement or refund of the purchase price. In no event shall Alpha Resources be liable for incidental or consequential damages. This certificate cannot be reproduced except in full.

This is a Certified Reference Material (working standard), and is traceable to the above-mentioned standards. For good laboratory practice it is recommended that all standards be verified prior to use. These test results are accredited under the Alpha Resources LLC laboratory's ISO/IEC 17025 and ISO Guide 34 accreditation (RMP) issued by ANSI-ASQ/ANAB. Refer to certificate and scope of accreditation(s) AC-1200 and AR-1920.

Certified November 10, 2016



Technical Manager