ALPHA RESOURCES® Value Beyond Measure

Certificate of Analysis

AR 301

CAST IRON CRM

LOT # 723D

% CARBON	% SULFUR
MEAN = 2.05	MEAN = 0.018
Standard Deviation = ± 0.04	Standard Deviation = ± 0.001
Expanded Uncertainty = ± 0.08	Expanded Uncertainty = ± 0.002
(k=2, @ 95% confidence. n=44)	(k=2, @ 95% confidence. n=48)

Method of Analysis is ASTM E 1019-18, and ARI-LAB-621
Primary (NMI)/Guide 34/ISO 17034 References Employed:

NIST	107c, 16e, 338, 341
NCS	HC11403, HC11010, HC11007
EURO	035-2, CKD230
JSS	102-8

ALPHA – AR301-1111C, AR301-1018D, AR300-1012A, AR299-614B, AR300-722W, AR301-112003, AR301-514D, AR322-919A, AE304-822F

The intended use of this reference standard is for the calibration and continued quality validation of Carbon and Sulfur in induction combustion, IR detection systems as described in ASTM E1019. The mean analytical values were derived from data sets showing traceability to the above-mentioned NMI standards and reported in mass fraction. The precision values represent the estimated mean, standard deviation, and expanded uncertainty derived from the data sets, using ISO Guide 35, ANOVA, and the Guide to Uncertainty Measurement. Metrological traceability is to the SI derived unit of mass fraction expressed as percent. The analytical sample test size used 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. 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, Chief Chemist, at Alpha Resources.

The material used in production of this reference was identified in accordance with ARI-LAB-603. The samples for round robin style testing were selected in accordance with ARI-LAB-625. The above values relate only to the material used to produce this reference standard. This bottle contains 150g cast iron powder to be used directly from the bottle with no preparation needed. Values are valid for 20 years from the date of certification. 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. Produced in accordance with ISO 17034.

This is a Certified Reference Material and is traceable to the above-mentioned standards. For good laboratory practice, it is recommended that all standards be verified as fit for purpose prior to use. These test results are accredited under the Alpha Resources LLC laboratory's ISO/IEC 17025 and ISO 17034 accreditation (RMP) issued by ANSI National Accreditation Board. Refer to certificate and scope of accreditation(s) AT-1200 and AR-1920.

Certified January 8, 2024
Updated February 14, 2025
Kent Dyer
Chief Chemist