

Alpha Resources, LLC

Certificate Of Analysis

AR-2863

RESIDUAL FUEL OIL STANDARD

LOT #863917

LID ID 863917

WEIGHT PERCENT SULFUR = 20.00

EXPANDED UNCERTAINTY = 0.43

(n=40)

Methods used for analysis:

ASTM D 1552-16, and ARI-035

Reference standards used: AR2863-863109, AR2862-862909, AR2864-864708, AR2863-631009, AR2863-863816

The intended use of this standard is for the calibration and or verification of sulfur analysis in petroleum based materials by combustion IR detection or other valid testing methods. This standard was produced gravimetrically using high purity materials, with balances calibrated by precision NIST traceable weights, and verified using the above ASTM method. The precision value represents the 95% confidence limit (k=2) derived from analysis and errors from weighing. The sample size used for analysis was approximately 50mg. Sample size and minimum sample size may be contingent upon your test method or instrumentation manufacturer recommendations. The material used in production of this standard was sampled in accordance with ARI 041. The samples for round robin testing were selected in accordance with ARI 031. 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 at Alpha Resources. Normal ASTM procedures should be employed when using this standard. This includes using the *reproducibility* and *repeatability* factors for the ASTM method you wish to employ for overall method uncertainty.

Before use, the contents of the bottle should be mixed through vigorous shaking. The contents should not be exposed to air for a lengthy period of time. This bottle contains 100ml residual fuel oil to be used per your test method or instrument manufacturer recommendations. When kept sealed and unopened this reference has an unlimited shelf life. Once opened this CRM is valid for two years only. This certificate cannot be reproduced except in full.

This is a Certified Reference Material (CRM), and is verified by the above-mentioned standards. For good laboratory practice, it is recommended that all standards be verified prior to use. 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.

These test results are accredited under the Alpha Resources Inc. 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.

EXPIRATION DATE

THIS CRM IS VALID FOR TWO YEARS FROM THE DATE OF OPENING

September 15, 2017

