

**% Carbon**  
Mean = 0.037  
Standard Deviation =  $\pm 0.001$   
Expanded Uncertainty =  $\pm 0.003$   
(k=2, @95% confidence limit) (n=36)

**%Sulphur**  
Mean = 0.015  
Standard Deviation =  $\pm 0.001$   
Expanded Uncertainty =  $\pm 0.002$   
(k=2, @95% confidence limit) (n=37)

Method of Analysis is ASTM E1019-18 and ARI-LAB-621

Primary (NMI)/ISO17034 Reference Materials Employed:

|          |  |
|----------|--|
| NIST SRM | 125b, 343a, 348a, 2160, 123c, 339, 2159, 20g, 100b |
| JSS      | 151-18   |
| BAM      | 191-2  |

ALPHA – AR870-127528707, AR871-521M, AR871-716A, AR871-218D, AR869-708917409, AR869-920K, AR869-316B, AR871-119A

The intended use of this reference standard is for the calibration and verification of induction combustion Carbon/Sulphur analysis by infra-red detection as described by ASTM E1019. The mean analytical values were derived by data sets showing traceability to the above-mentioned reference standards and reported in mass fraction. The minimum and typical size for testing was 1g (1 ring) per ASTM E1019. The precision values represent the mean value and estimated uncertainty derived from the data sets utilizing ANOVA, ISO Guide 35, and the Guide to Uncertainty Measurement. Metrological traceability is to the SI derived unit of mass fraction expressed as percent. Refer to your test method for additional uncertainty information. When necessary, professional judgment is applied toward consideration of data and statistical information.

The material used in production of this standard 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 standard. This bottle contains 454g, 1g rings (nominal weight), to be used directly from the bottle with no preparation needed. While unable to determine a definite shelf life this reference should be reviewed 25 years after 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 Elemental Microanalysis Ltd be liable for incidental or consequential damages. This certificate cannot be reproduced except in full.

This Reference Material is traceable to the above-mentioned reference materials. For good laboratory practice, it is recommended that all standards be verified as fit for purpose prior to use.

Certified on the 28<sup>th</sup> of April 2023

Elemental Microanalysis Ltd