

**Certificate of Analysis
Part No. B2502
Carbon & Sulphur Ring Standard**

Certificate Number 420W
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% Carbon
Mean = 0.170
Standard Deviation = ± 0.003
Expanded Uncertainty = ± 0.007
(k=2, @ 95% confidence limit) (n=47)

%Sulphur
Mean = 0.0069
Standard Deviation = ± 0.0006
Expanded Uncertainty = ± 0.0016
(k=2, @ 95% confidence limit) (n=43)

Method of analysis is ASTM E1019-18 and ARI 033

Primary (NMI)/ISO17034 Reference Standards Employed:

NIST SRM	19h, 106b, 155, 133b, 50c, 343a, 129c
BAM/BCS	291-1, 235-1, 232/2
JSS	030-9, 154-14
NCS	HC11111, HC11325
JK	7b

ALPHA - AR872-119C, AR868-818A, AR872-714G, AR946-516E, AR885-118A, AR872-317C

Notes:

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 primary 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 032. The samples for round robin style testing were selected in accordance with ARI 014. 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 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 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 June 30, 2020

Elemental Microanalysis Limited