



Certificate of Analysis

AR 676

HIGH OXYGEN & NITROGEN STEEL PIN CRM

LOT # 123A

% OXYGEN

MEAN = 0.028

Standard Deviation = ± 0.005

Expanded Uncertainty = ± 0.010

(k=2, @ 95% confidence, n=47)

% NITROGEN

MEAN = 0.146

Standard Deviation = ± 0.004

Expanded Uncertainty = ± 0.008

(k=2, @ 95% confidence, n=43)

*NOTE: The addition of graphite powder was used for analysis. The black/brown color of the pin is normal.

Method of Analysis is ASTM E 1019-18, and ARI-LAB-622

Primary (NMI)/ISO17034 Reference Materials Employed:

NIST	1090, 343a, 346a, 73c
NCS	HC11325
JSS	389-1
EURO	291-1, 231-2

**ALPHA - AR676-419H, AR676-514B, AR676-311B, AR675-514C, AR662-517B,
AR659-C10A, AR670-216A, AR676-60106**

This pin reference standard is intended to be a calibration or QC validation of Oxygen and Nitrogen on inert gas fusion analyzers utilizing infrared and thermal conductivity detection as described in ASTM E1019. The analytical sample and minimum size used for testing was 1 pin (0.5g nominal). The precision values represent the estimated mean, standard deviation, and expanded uncertainty derived from 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. Refer to your test method and or your instrument manufacturer for the expanded method derived uncertainty. 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 standard was identified in accordance with ARI-LAB-603. The samples for round-robin testing were selected in accordance with ARI-LAB-625. The above values relate only to the material used to produce this reference standard. This reference contains 50g, 0.5g pins (nominal), to be used directly from the bottle with no preparation. Values are valid for 20 years from the date of certification. Keep sealed and store under normal laboratory conditions. This reference material was produced in accordance with ISO 17034 and ISO Guide 31.

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 CRM and is traceable to the above-mentioned reference standards. For good laboratory practice, it is recommended that all reference materials 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-ANAB. Refer to certificate and scope of accreditation(s) AT-1200 and AR-1920.

Certified June 28, 2023
Updated February 14, 2025
Kent Dyer
Chief Chemist