

# Alpha Resources, LLC

## Certificate Of Analysis

AR 661  
OXYGEN & NITROGEN PIN REFERENCE STANDARD  
LOT # 517C

**% OXYGEN**  
MEAN = 0.0008  
One Sigma Standard Deviation = +/- 0.0001  
Expanded Uncertainty = +/- 0.0002  
(k=2, @ 95% confidence, n=49)

**% NITROGEN**  
MEAN = 0.0091  
One Sigma Standard Deviation = +/- 0.0008  
Expanded Uncertainty = +/- 0.0016  
(k=2, @ 95% confidence, n=47)

Method of Analysis is ASTM E 1019-11, and ARI 034

Primary (NMI) Standards Employed:

NIST	368
NCS	NS21007, NS11027
BAS	058-2
BAM	099-1

ALPHA – AR661-914B, AR657-916A, AR660-317B, AR668-1014B, AR661-A9574H

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). The mean analytical values were derived by data sets showing traceability to the above-mentioned reference standards, and reported in mass fraction. The precision values represent the estimated uncertainty derived from the data sets and may not represent your testing capabilities. 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, Technical Manager, at Alpha Resources.

The material used in production of this standard was identified in accordance with ARI 032. The samples for round-robin testing were selected in accordance with ARI 014. 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. This reference material has an indefinite shelf life. Keep sealed and store under normal laboratory conditions. This reference material was produced in accordance to 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 Certified Reference Material (working reference standard), and is traceable to the above-mentioned standards. For good laboratory practice, it is recommended that all standards be verified prior to use. These test results are accredited under the Alpha Resources LLC laboratory's ISO/IEC 17025 and ISO Guide 34 accreditation (RMP) issued by ANSI-ASQ/ANAB. Refer to certificate and scope of accreditation(s) AT-1200 and AR-1920.

Certified July 14, 2017

  
Technical Manager