

Alpha Resources, LLC

Certificate Of Analysis

AR 645
OXYGEN & NITROGEN PIN STANDARD
LOT # 416A

% OXYGEN
MEAN = 0.007
One Sigma Standard Deviation = +/- 0.001
Expanded Uncertainty = +/- 0.002
(k=2, @ 95% confidence, n=65)

% NITROGEN
MEAN = 0.0059
One Sigma Standard Deviation = +/- 0.0003
Expanded Uncertainty = +/- 0.0007
(k=2.3, @ 95% confidence, n=59)

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

Primary (NMI) Standards Employed:

NIST	12h, 163
NCS	NS22005, NS20035b, NS21006, NS11027, NS21010
JSS	SS2-76, SS3-41
BAM	099-1

Notes:

This pin standard is intended to be a calibration or QC validation on inert gas fusion analyzers utilizing infrared and thermal conductivity detection as described in ASTM E1019. The sample size used for testing was 1 pin. 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 standard. This reference contains 100g, 1.0g pins (nominal), to be used directly from the bottle with no preparation. This standard has an indefinite shelf life. Keep sealed and store under normal laboratory conditions. This reference material was produced in accordance to ISO Guide 34 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 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 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.

Certified October 27, 2016

