

Alpha Resources, Inc.

Certificate Of Analysis

AR 641
TITANIUM STANDARD
LOT # 315A

% OXYGEN
MEAN = 0.196
One Sigma Standard Deviation = +/- 0.006
Expanded Uncertainty = +/- 0.013
(k=2.17, 95% confidence) (n=60)

% NITROGEN*
MEAN = 0.0304
One Sigma Standard Deviation = +/- 0.0019
Expanded Uncertainty = +/- 0.0038
(k=2, 95% confidence)(n=120)

*KJELDAHL NITROGEN VALUES: REFERENCED TO NIST 360b = 0.0289%
REFERENCED TO NCS NS57104 = 0.0316%

% HYDROGEN
MEAN = 0.0039
One Sigma Standard Deviation = +/- 0.0003
Expanded Uncertainty = +/- 0.0006
(k=2, 95% confidence)(n=50)

Method of Analysis is ASTM E 1409-13*, E 1447-09, ARI 034, and ARI 036

Primary (NMI) Standards used for traceability:

NIST SRM	2452, 2453, 360b, 173c
BCR CRM	059b
BCS	357, 356
NCS CRM	NS57103, NS57104

Notes

The mean analytical values were derived by separate 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 for the expanded method derived uncertainty if needed. 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. This certificate cannot be reproduced except in full.

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 bottle consists of 10g material in .1g pins and is to be used directly from the bottle without preparation. Multiple pins may be used per test method requirements. This product has an indefinite shelf life. 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 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, June 18, 2015



Kent Dyer, Technical Manager

P.O Box 199 3090 Johnson Road Stevensville, MI 49127 Phone (269) 465-5559 Fax (269) 465-3629

www.alpharesources.com

Page 1 Of 1