

**Certificate of Analysis
Part No. B2419
Steel Pin Standard**

Certificate Number 819D
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% Oxygen
Mean = 0.0007
Standard Deviation = ± 0.0002
Expanded Uncertainty = ± 0.0004
(k=2, @ 95% confidence, n=52)

% Nitrogen *
Mean = 0.0030 *
Standard Deviation = ± 0.0005
Expanded Uncertainty = ± 0.0010
(k=2, @ 95% confidence, n=76)

Method of Analysis is ASTM E 1019-18, and ARI 034

Primary (NMI) Standard Employed:

NIST	1098, 1096
NCS	NS21007
BAM	079-1
JSS	384-1, 367-9, 102-8

ALPHA – AR644-115C, AR1653-211A, AR1653-714A, AR1653-815D, AR644-718B,
AR1653-1017B, AR1653-713A

Notes

This pin reference standard is intended to be a calibration or QC validation of Oxygen and Nitrogen on inert gas fusion analysers utilizing infrared and thermal conductivity detection as described in ASTM E1019. The analytical sample and minimum size used for testing was 1 pin (1g 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 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 100g, 1g pins (nominal), to be used directly from the bottle with no preparation. While unable to determine a definite shelf life, this reference should be reviewed every 25 years from the 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 certificate cannot be reproduced except in full.

This reference material is traceable to the above-mentioned reference materials. For good laboratory practice, it is recommended that all reference materials be verified fit for purpose prior to use.

*This certificate was revised on December 31, 2019 to reflect a new Nitrogen value based on additional data.

Certified November 22, 2019

Elemental Microanalysis Limited