

Alpha Resources, Inc.

Certificate Of Analysis

AR 546
HYDROGEN IN STEEL
LOT # 512B
(Revised March 14, 2013)

TOTAL HYDROGEN (melted/fused)
MEAN VALUE = 0.83 PPM (ug/g) (0.000083 wt. %)
ONE SIGMA STANDARD DEVIATION = +/- 0.000022 wt. %
EXPANDED UNCERTAINTY = +/- 0.000044 wt. %
(Expanded uncertainty k=2, 95% confidence)

Method of Analysis:

1. LECO RH-404 Inert Gas Fusion, TC Detection

Diffusible Hydrogen (non-melted sample) = 0.000047 wt. % (reference only by vacuum hot extraction)

Standard reference materials used for certification:

JSS CRM	GS-1d
BAM	Stahl -H1

Notes:

Due to the extreme low hydrogen value, this standard is valued at the detection limit of most instrumentation. This is reflected in the large range of values and high standard deviation. *This standard was revised on March 14, 2013, to remove and correct observed high bias, and include new data compared to BAM Stahl-H1 NMI standard.* The precision values represent the one-sigma standard deviation and two-sigma standard deviation (k=2, 95% confidence). The new data consists of n=70 data points.

The material used in production of this standard was sampled 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 certificate cannot be reproduced except in full. The statistical analysis, overall direction, and coordination of the analytical measurements leading to certification were performed by K. E. Dyer at Alpha Resources Inc. This bottle contains 100, 1g pins (nominal), to be used directly from the bottle. This standard has an indefinite shelf life, kept sealed and stored 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 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.

Certified September 14, 2012 (revised March 14, 2013)



Technical Manager

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