

Alpha Resources, Inc.

Certificate Of Analysis

AR 947

CARBON STEEL CHIP STANDARD

LOT # 22900

% CARBON

MEAN = 0.389

ONE SIGMA = 0.008

TWO SIGMA = 0.016

RANGE = 0.373 – 0.405

% SULFUR

MEAN = 0.094

ONE SIGMA = 0.003

TWO SIGMA = 0.006

RANGE = 0.088 – 0.100

PPM NITROGEN

MEAN = 121

ONE SIGMA = 5

TWO SIGMA = 10

RANGE = 111 - 131

Method of Analysis is ASTM E 1019

(Latest Revision)

Carbon & Sulfur is combustion / IR detection

Nitrogen is inert gas fusion / TC cell detection

The certified mean values were derived by a number of data sets provided by ASTM approved instruments.

The precision values represent the standard deviation, two times the standard deviation, and complete range of analyses.

Standards Employed were:

| | | |
|--------|-----|-----------------------------|
| NIST | SRM | 367, 50c, 8j, 12h, 11h, 73c |
| German | BAM | 035-1, 086-1, 079-1 |
| Japan | JSS | 602-9, 150-14, GS-5C |
| UK | BCS | 306/1 |

Notes:

The statistical analysis, overall direction and coordination of the analytical measurements leading to certification were performed by K.E. Dyer at Alpha Resources.

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 secondary standard reference material, and should be verified prior to use against a primary standard material provided by a governing agency such as N.I.S.T., when available.

Certified June, 2000

P.O. Box 199 3090 Johnson Road Stevensville, MI 49127 USA Phone

www.alpharesources.com

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