Alpha Resources, Inc.
Certificate Of Analysis

AR 147
COPPER PIN STANDARD
LOT # 02855403

PPM OXYGEN	PPM SULFUR
MEAN = 10	MEAN = 11
ONE SIGMA = 1.5	ONE SIGMA = 2
TWO SIGMA = 3	TWO SIGMA = 4
RANGE = 7 – 13	RANGE = 7 – 15

PPM CARBON = 20 PPM (REFERNCE ONLY)
PPM NITROGEN = 1.0PPM (REFERENCE ONLY)
PPM HYDROGEN = 2 PPM (REFERENCE ONLY)

Method of Analysis

Carbon/Sulfur	Combustion – IR Detection
Oxygen/Nitrogen	Inert Gas Fusion – TC Detection
Hydrogen	Inert Gas Fusion – TC Detection (Gas Dose)

Primary Standards Employed:

NIST	494, 495, 496, 1096, 1097, 1098, 2159
INFM	CuS-20
JSS	GS-1d, GS-2c, 244-5

Notes:

The mean analytical values were derived by a number of data sets utilizing various ASTM approved instruments.

The precision values represent the standard deviation, two times the standard deviation, and complete range of analysis. When necessary, professional judgment is applied toward consideration of data and statistical information. Carbon, Nitrogen and Hydrogen are given for reference only.

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

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.

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 (CRM), and is traceable to the above-mentioned standards. For good laboratory practice it is recommended that all standards be verified prior to use.

Certified December, 2003

Kent Dyer

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