ALPHA RESOURCES LLC

Value Beyond Measure

For Immediate Release

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2020 in Review

CRMs & Facility Expansion Among the Changes

Stevensville, Michigan, January 26, 2021 – 2020, despite the many challenges within global markets, contained several notable milestones for Alpha Resources LLC, the largest US manufacturer of aftermarket consumables and reference materials.

Alpha Resources had several company firsts in the creation of useful new CRM offerings: a ferrochrome CRM, AR308; a high-carbon Iconel CRM, AR943; an EDTA CRM, AR2092 as well as a new CRM for Calcium Oxalate, AR5029. Additionally, the Alpha lab team certified a half dozen of the highly sought-after titanium CRMs, which are often used in the critical industrial sectors of aerospace and medical.

Production space doubled at Alpha Resources in Q3 with the addition of a new SW Michigan manufacturing location. This expansion proceeds the planned 2021 expansion of Alpha's on-site lab capabilities at the current location. Additional growth at the new Alpha Resources manufacturing building is projected over the next 18 months. The company also expects to hire several additional manufacturing positions.

Overview on the following pages of Alpha Resource's 2020 Certified Reference Materials releases.

About Alpha Resources

Founded in 1978, Alpha Resources, LLC is a global leader in the manufacture and distribution of consumables and creation of certified reference materials for use in atomic spectroscopy analysis, and is ISO17034, ISO17025, ISO9001:2015 certified.

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2020 List of Organic Certified Reference Materials

- AR747 | Lot 747919 (Green Pet Coke)
- AR1683 | Lot 683120 (0.055±0.04% S Ultra Low Sulfur Coal)
- AR1685 | Lot 685720 (0.146%S Ultra Low Sulfur Coal CRM)
- AR1703 | Lot 031120 (0.87±0.04 %S Coal CRM)
- AR1705 | Lot 051020 (1.46%S Sulfur Coal CRM)
- AR1706 | Lot 706818 (2.04±0.03%S in Coal)
- AR1720 | Lot 720220 (Prox. Coal Standard)
- AR1723 | Lot 723320 (Proximate Coal CRM)
- AR1729 | Lot 729320 (Proximate Coal CRM)
- AR1732 | Lot 732520 (Proximate Coal CRM)
- AR1733 | Lot 733420 (Proximate Anthracite Coal CRM)
- AR2047 | Lot 047420 (0.98±0.03% S in Crude Oil)
- AR2049 | Lot 049220 (3.07±0.11% S in Crude Oil)
- AR2050 | Lot 501020 (4.31±0.18% S in Crude Oil)
- AR2775 | Lot 751219 (Ultimate Coal Standard)
- AR2780 | Lot 780320 (Ultimate Coal CRM)
- AR2783 | Lot 783320 (Ultimate Anthracite Coal CRM)
- AR2816 | Lot 816620 (2.89±0.11% S in Residual Oil)
- AR2826 | Lot 261020 (1.57±0.08% S in Diesel #2)
- AR2836 | Lot 836520 (2.00±0.06% S in Lube Oil)
- AR2839 | Lot 839320 (2.97±0.06% S in Lube Oil)
- AR2862 | Lot 862220 (9.64±0.66% S in Residual Oil)
- AR2864 | Lot 864220 (29.04±1.56% S in Residual Oil)
- AR2896 | Lot 896720 (0.69±0.04% S in Residual Oil)
- AR3085 | Lot N25G036 (Zinc Sulfide CRM)
- AR5029 | Lot 520Y (Calcium Oxalate CRM)

AR 2092 (50g) and AR2092-250 (250g) | EDTA CRM | LOT # 520A

Theoretical Values:	% ANALYSIS
Carbon – 41.099%	Carbon MEAN = 41.10% ± 0.16%
Hydrogen – 5.519%	Hydrogen MEAN = 5.52% ± 0.06%
Nitrogen – 9.586%	Nitrogen MEAN = 9.59% ± 0.15%
Oxygen – 43.796%	Oxygen MEAN = 43.79% ± 0.17%

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A complete list of Alpha Resources certified reference materials maybe found online at: https://www.alpharesources.com/current-list-of-standards.php

2020 List of Inorganic Certified Reference Materials

AR 302 | CAST IRON CRM | Lot 620C

% CARBON	% SULFUR
MEAN = 3.31	MEAN = 0.0203
Standard Deviation = ± 0.02	Standard Deviation = ± 0.0004
Expanded Uncertainty = ± 0.05	Expanded Uncertainty = ± 0.0011
(k=2, @ 95% confidence) (n=38)	(k=2, @ 95% confidence) (n=37)

AR 308 | FERROCHROME CRM |Lot 619B (Alpha Resources first ferrochrome)

% CARBON	% SULFUR
MEAN = 9.17*	MEAN = 0.108
Standard Deviation = ± 0.14	Standard Deviation = ± 0.002
Expanded Uncertainty = ± 0.33	Expanded Uncertainty = ± 0.005
(k=2, @ 95% confidence) (n=47)	(k=2, @ 95% confidence) (n=45)

**Value exceeds scope limit for the ASTM test method used*

AR 310 | CAST IRON CRM |Lot 120C

% CARBON	% SULFUR
MEAN = 3.14	MEAN = 0.083
Standard Deviation = ± 0.04	Standard Deviation = ± 0.003
Expanded Uncertainty = ± 0.08	Expanded Uncertainty = ± 0.006
(k=2, @ 95% confidence) (n=41)	(k=2, @ 95% confidence) (n=43)

AR 315 | CAST IRON CRM |Lot 220H

% CARBON	% SULFUR
MEAN = 3.08	MEAN = 0.108
Standard Deviation = ± 0.03	Standard Deviation = ± 0.004

Expanded Uncertainty = ± 0.07	Expanded Uncertainty = ± 0.010
(k=2, @ 95% confidence) (n=31)	(k=2, @ 95% confidence) (n=34)

AR322 | CAST IRON CRM | Lot 919A

% Carbon	% Sulfur
MEAN = 3.32	MEAN = 0.034
Standard Deviation = ± 0.03	Standard Deviation = ± 0.001
Expanded Uncertainty = ± 0.06	Expanded Uncertainty = ± 0.003
(k=2, @ 95% confidence. n=46)	(k=2, @ 95% confidence. n=34)

AR 586 | TITANIUM CRM |Lot 120D

% CARBON	% HYDROGEN
MEAN = 0.020	MEAN = 0.0019
Standard Deviation = ± 0.001	Standard Deviation = ± 0.0005
Expanded Uncertainty = ± 0.003	Expanded Uncertainty = ± 0.0005
(k=2, @ 95% confidence) (n=30)	(k=2, @ 95% confidence) (n=34)

AR587 | TITANIUM CRM |Lot 619A

% Carbon	% Hydrogen
MEAN = 0.008	MEAN = 0.0099
Standard Deviation = +/- 0.001	Standard Deviation = +/- 0.0004
Expanded Uncertainty = +/- 0.002	Expanded Uncertainty = +/- 0.0009
(k=2, @ 95% confidence) (n=34)	(k=2, @ 95% confidence) (n=45)

AR 631 | TITANIUM REFERENCE CRM | Lot 1019A

% OXYGEN	% NITROGEN	% HYDROGEN
MEAN = 0.361	MEAN = 0.0058	MEAN = 0.0016
Standard Deviation = ± 0.006	Standard Deviation = ± 0.0011	Standard Deviation = ± 0.0001
Expanded Uncertainty = ± 0.015	Expanded Uncertainty = ± 0.0024	Expanded Uncertainty = ± 0.0003
(k=2, @ 95% confidence) (n=33)	(k=2, @ 95% confidence) (n=34)	(k=2, @ 95% confidence) (n=34)

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AR635 | TITANIUM REFERENCE CRM |Lot 719E

% Oxygen	% Nitrogen	% Hydrogen
MEAN = 0.147	MEAN = 0.014	MEAN = 0.0041
Standard Deviation = +/- 0.006	Standard Deviation = +/- 0.001	Standard Deviation = ± 0.0003
Expanded Uncertainty = +/- 0.012	Expanded Uncertainty = +/- 0.002	Expanded Uncertainty = ± 0.0006
(k=2, @ 95% confidence) (n=33)	(k=2, @ 95% confidence) (n=34)	(k=2, @ 95% confidence limit, n=57)

AR 641 | TITANIUM REFERENCE CRM | Lot 720D

% OXYGEN	% NITROGEN	% HYDROGEN
MEAN = 0.196	MEAN = 0.032	MEAN = 0.0045
Standard Deviation = ± 0.006	Standard Deviation = ± 0.002	Standard Deviation = ± 0.0003
Expanded Uncertainty = ± 0.012	Expanded Uncertainty = ± 0.005	Expanded Uncertainty = ± 0.0007
(k=2, @ 95% confidence) (n=40)	(k=2, @ 95% confidence) (n=39)	(k=2, @ 95% confidence) (n=39)

AR 645 | OXYGEN & NITROGEN STAINLESS STEEL PIN CRM |Lot 1119B

% OXYGEN	% NITROGEN
MEAN = 0.0035	MEAN = 0.0089
Standard Deviation = ± 0.0004	Standard Deviation = ± 0.0004
Expanded Uncertainty = ± 0.0009	Expanded Uncertainty = ± 0.0009
(k=2, @ 95% confidence) (n=34)	(k=2, @ 95% confidence) (n=45)

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AR 647 | TITANIUM REFERENCE CRM | Lot 220G

% OXYGEN	% NITROGEN	% HYDROGEN
MEAN = 0.111	MEAN = 0.0039	MEAN = 0.0122
Standard Deviation = ± 0.006	Standard Deviation = ± 0.0007	Standard Deviation = ± 0.0003
Expanded Uncertainty = ± 0.013	Expanded Uncertainty = ± 0.0014	Expanded Uncertainty = ± 0.0006
(k=2, @ 95% confidence) (n=36)	(k=2, @ 95% confidence) (n=36)	(k=2, @ 95% confidence) (n=42)

AR 648 |HYDROGEN, OXYGEN & NITROGEN TITANIUM REFERENCE CRM | Lot 1219A

% OXYGEN	% NITROGEN	% HYDROGEN
MEAN = 0.115	MEAN = 0.0060	MEAN = 0.0153
Standard Deviation = ± 0.005	Standard Deviation = ± 0.0008	Standard Deviation = ± 0.0004
Expanded Uncertainty = ± 0.012	Expanded Uncertainty = ± 0.0017	Expanded Uncertainty = ± 0.0008
(k=2, @ 95% confidence) (n=34)	(k=2, @ 95% confidence) (n=30)	(k=2, @ 95% confidence) (n=32)

AR 650 | TITANIUM REFERENCE CRM | Lot 520X

% OXYGEN	% NITROGEN	% HYDROGEN
MEAN = 0.100	MEAN = 0.0060	MEAN = 0.0090
Standard Deviation = ± 0.006	Standard Deviation = ± 0.0007	Standard Deviation = ± 0.0005
Expanded Uncertainty = ± 0.013	Expanded Uncertainty = ± 0.0015	Expanded Uncertainty = ± 0.0010
(k=2, @ 95% confidence) (n=51)	(k=2, @ 95% confidence) (n=65)	(k=2, @ 95% confidence) (n=58)

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AR 657 | OXYGEN & NITROGEN STEEL PIN CRM | Lot 420T

% OXYGEN	% NITROGEN
MEAN = 0.0096	MEAN = 0.0101
Standard Deviation = ± 0.0005	Standard Deviation = ± 0.0002
Expanded Uncertainty = ± 0.0011	Expanded Uncertainty = ± 0.0004
(k=2, @ 95% confidence, n=40)	(k=2, @ 95% confidence, n=55)

AR 659 | OXYGEN & NITROGEN STEEL PIN CRM | Lot 720E

% OXYGEN	% NITROGEN
MEAN = 0.0099	MEAN = 0.0055
Standard Deviation = ± 0.0005	Standard Deviation = ± 0.0002
Expanded Uncertainty = ± 0.0012	Expanded Uncertainty = ± 0.0005
(k=2, @ 95% confidence) (n=36)	(k=2, @ 95% confidence) (n=49)

AR 662 | OXYGEN & NITROGEN STAINLESS STEEL PIN CRM |Lot 919B

% OXYGEN	% NITROGEN
MEAN = 0.0026	MEAN = 0.073
Standard Deviation = ± 0.0002	Standard Deviation = ± 0.001
Expanded Uncertainty = ± 0.0005	Expanded Uncertainty = ± 0.002
(k=2, @ 95% confidence) (n=34)	(k=2, @ 95% confidence) (n=34)

AR 673 | WROUGHT IRON CHIP CRM | Lot 120F

% CARBON	% SULFUR
MEAN = 0.0006	MEAN = 0.0016
Standard Deviation = ± 0.0002	Standard Deviation = ± 0.0002
Expanded Uncertainty = ± 0.0003	Expanded Uncertainty = ± 0.0004
(k=2, @ 95% confidence limit) (n=50)	(k=2, @ 95% confidence limit) (n=61)

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AR 872 | CARBON STEEL RING CRM | Lot 420W

% CARBON	% SULFUR
MEAN = 0.170	MEAN = 0.0069
Standard Deviation = ± 0.003	Standard Deviation = ± 0.0006
Expanded Uncertainty = ± 0.007	Expanded Uncertainty = ± 0.0016
(k=2, @ 95% confidence limit) (n=47)	(k=2, @ 95% confidence limit) (n=43)

AR 874 | CARBON STEEL RING CRM | Lot 1119A

% CARBON	% SULFUR
MEAN = 0.658	MEAN = 0.0108
Standard Deviation = ± 0.005	Standard Deviation = ± 0.0002
Expanded Uncertainty = ± 0.010	Expanded Uncertainty = ± 0.0006
(k=2, @ 95% confidence) (n=32)	(k=2, @ 95% confidence) (n=33)

AR 884 | CARBON STEEL PIN CRM | Lot 420U

% CARBON	% SULFUR
MEAN = 0.472	MEAN = 0.0121
Standard Deviation = ± 0.007	Standard Deviation = ± 0.0005
Expanded Uncertainty = ± 0.015	Expanded Uncertainty = ± 0.0011
(k=2, @ 95% confidence limit) (n=58)	(k=2, @ 95% confidence limit) (n=58)

AR 885 | CARBON STEEL PIN CRM | Lot 520Z

% CARBON	% SULFUR
MEAN = 0.820	MEAN = 0.0055
Standard Deviation = ± 0.005	Standard Deviation = ± 0.0002
Expanded Uncertainty = ± 0.010	Expanded Uncertainty = ± 0.0004
(k=2, @ 95% confidence limit) (n=38)	(k=2, @ 95% confidence limit) (n=40)

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AR 890 | STAINLESS STEEL PIN CRM |Lot 320M

% CARBON	% SULFUR
MEAN = 0.110	MEAN = 0.0046
Standard Deviation = ± 0.001	Standard Deviation = ± 0.0003
Expanded Uncertainty = ± 0.003	Expanded Uncertainty = ± 0.0006
(k=2, @ 95% confidence limit) (n=31)	(k=2, @ 95% confidence limit) (n=32)

AR 892 | STAINLESS STEEL PIN CRM |Lot 120E

% CARBON	% SULFUR
MEAN = 0.0057	MEAN = 0.0028
Standard Deviation = ± 0.0003	Standard Deviation = ± 0.0003
Expanded Uncertainty = ± 0.0008	Expanded Uncertainty = ± 0.0007
(k=2, @ 95% confidence limit) (n=31)	(k=2, @ 95% confidence limit) (n=34)

AR 943 | 718 INCONEL POWDER CRM | Lot 719G*

% CARBON	% SULFUR	% NITROGEN	% OXYGEN
MEAN = 0.032	MEAN = 0.0016	MEAN = 0.0125	MEAN = 0.0189
Standard Deviation = ± 0.001	Standard Deviation = ± 0.0002	Standard Deviation = ± 0.0007	Standard Deviation = ± 0.0012
Expanded Uncertainty = ± 0.003	Expanded Uncertainty = ± 0.0004	Expanded Uncertainty = ± 0.0016	Expanded Uncertainty = ± 0.0026
(k=2, @ 95% confidence) (n=54)	(k=2, @ 95% confidence) (n=54)	(k=2, @ 95% confidence) (n=35)	(k=2, @ 95% confidence) (n=41)

**This is a product first for Alpha Resources*

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AR 949 | STAINLESS STEEL CHIP CRM | Lot 320L

% CARBON	% SULFUR	% NITROGEN
MEAN = 0.022	MEAN = 0.032	MEAN = 0.0404
Standard Deviation = ± 0.001	Standard Deviation = ± 0.003	Standard Deviation = ± 0.0005
Expanded Uncertainty = ± 0.003	Expanded Uncertainty = ± 0.006	Expanded Uncertainty = ± 0.0013
(k=2, @ 95% confidence) (n=33)	(k=2, @ 95% confidence) (n=32)	(k=2, @ 95% confidence) (n=27)

AR961 | STAINLESS STEEL POWDER CRM |Lot 719B

% Carbon	% Sulfur	% Nitrogen
MEAN = 0.0242	MEAN = 0.0100	MEAN= 0.046
Standard Deviation = +/- 0.0005	Standard Deviation = +/- 0.0004	Standard Deviation = ± 0.001
Expanded Uncertainty = +/- 0.0014	Expanded Uncertainty = +/- 0.0010	Expanded Uncertainty = ± 0.003
(k=2, @ 95% confidence) (n=36)	(k=2, @ 95% confidence) (n=36)	(k=2, @ 95% confidence) n=33)

AR 3085 | ZINC SULFIDE CRM | Lot N25G036

% SULFUR (by purity)	% SULFUR (by analysis)
MEAN = 3.29%	MEAN = 32.9%
Expanded Uncertainty = ± 0.003	Expanded Uncertainty = ± 1.1
Purity = 99.99%	(k=2.07, 95% confidence) (n=23)

AR 4016 | CARBON AND SULFUR IN SOIL CRM | Lot 320Q

% CARBON	% SULFUR
MEAN = 2.05	MEAN = 2.05

Expanded Uncertainty = ± 0.14	Expanded Uncertainty = ± 0.09
(k=2, @ 95% confidence) (n=30)	(k=2, @ 95% confidence) (n=34)

AR4017 | CARBON & SULFUR IN SOIL CRM | Lot 420R

% CARBON	% SULFUR
MEAN = 0.49	MEAN = 0.48
Standard Deviation = ± 0.07	Standard Deviation = ± 0.04
(k=2, @ 95% confidence) (n=59)	(k=2, @ 95% confidence) (n=54)

AR 9565 | HIGH SULFUR CARBON STEEL CHIP CRM | Lot 320P

% CARBON	% SULFUR	% NITROGEN
MEAN = 0.430	MEAN = 0.261	MEAN = 0.0069
Standard Deviation = ± 0.004	Standard Deviation = ± 0.007	Standard Deviation = ± 0.0002
Expanded Uncertainty = ± 0.008	Expanded Uncertainty = ± 0.015	Expanded Uncertainty = ± 0.0005
(k=2, @ 95% confidence) (n=34)	(k=2, @ 95% confidence) (n=30)	(k=2, @ 95% confidence) (n=31)

KED 1025 | OXYGEN & NITROGEN IRON POWDER CRM |Lot 419E

% OXYGEN	% NITROGEN
MEAN = 0.91	MEAN = 0.0133
Standard Deviation = ± 0.04	Standard Deviation = ± 0.0013
Expanded Uncertainty = ± 0.08	Expanded Uncertainty = ± 0.0037
(k=2, @ 95% confidence limit) (n=47)	(k=2, @ 95% confidence limit) (n=46)

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