AMETEK®
SPECIALTY METAL PRODUCTS

POWDER • TUBE • STRIP

MASTER ALLOYS: Specialty

TECHNICAL DATA SHEET

Reading Alloys produces a variety of specialty master alloys primarily for the titanium industry, consisting of elemental make ups outside of the popular master alloy product categories.

ReadingAlloys
advanced engineered materials®

INTRODUCTION

Reading Alloys innovates and produces superior master alloys, specialty alloys and metal powder products renowned for high purity and specific material characteristics. From aerospace to medical, to military to electronics, applications that demand the ultimate in performance rely on Reading Alloys' products. The company is widely recognized for its expertise in aluminothermic smelting, induction melting, vacuum sintering, metal powder production and electron beam refining.

Recognized as a premier supplier in applications where ultimate quality is critical; Reading Alloys produces high-purity materials in accordance with a certified ISO 9001/AS 9100 quality management system and tested by a Nadcap accredited analytical laboratory. Our company maintains comprehensive quality assurance processes and precision material characterization systems to support the continued development of our core master alloys and high-purity fine powders.

APPLICATIONS

Reading Alloys produces a wide variety of specialty alloys for custom applications. Alloys for the electronics industry, powder metallurgy, high temperature coatings and grain refinement represent just a few applications. Through the utilization of thermite smelting, induction melting, electron beam refinement, hydride/dehydride processing and CIP processing, we are able to supply and exceed your custom alloy requirements.

Some of our master alloys enhance the process or improve the performance characteristics of castings for the aluminum and copper industries. Special master alloys are often used to increase heat treatment properties and to improve strength and wear resistance or act as hardeners such as Al-Si, Al-Co and Al-Cu.

Other master alloys are formulated to meet the specific chemistries and melting requirements of a variety of industries. If it can be alloyed, Reading Alloys can advise an optimum master alloy composition for cost effective production.

Reading Alloys also produces metal powders for the military and medical market. Other alloys and alloy combinations, sizes and powder products are available upon request. Our unparalleled experience in alloy design and manufacturing enable us to gain an in-depth understanding of customer specific material requirements and expectations.

Please contact us to review your requirements at
rai.sales@ametek.com

MASTER ALLOYS: SPECIALTY

Element %	Al-Fe-P	Al-Mo-Sn-Ti-Zr (Ti-6242)	Al-Mo-Sn-Ti-Zr (Ti-6246)	Ti-5553 Master Alloy
Aluminum	Balance	38-43%	28.5-31%	Balance
Iron	12-18%	0.45% Max	0.45% Max	1-2%
Phosphorous	4.4-5.5%	0.035% Max	0.035% Max	0.035% Max
Molybdenum	--	12-17%	33-35.5%	28-33%
Tin	--	11-16%	9-11.5%	--
Titanium	0.5% Max	5% Max	3-4%	0.50% Max
Zirconium	--	25-30%	19.5-22%	0.4% Max
Vanadium	--	--	--	27.25-29.25%
Boron	--	0.003% Max	0.003% Max	0.003% Max
Carbon	0.1% Max	0.10% Max	0.10% Max	0.10% Max
Chromium	--	--	--	15.75%-17.75%
Lead	--	--	--	0.003% Max
Magnesium	--	0.25% Max	0.25% Max	--
Manganese	0.6% Max	--	--	--
Nickel	--	--	--	0.15% Max
Others-Each	0.20% Max	--	--	--
Selenium	--	--	--	--
Silicon	1.0% Max	0.35% Max	0.35% Max	0.35% Max
Sulfur	--	0.024% Max	0.024% Max	0.02% Max
Hydrogen	--	0.03% Max	0.03% Max	--
Nitrogen	--	0.04% Max	0.04% Max	0.02% Max
Oxygen	--	0.10% Max	0.15% Max	0.15% Max

RAI ID#	RAI-0105	RAI-0030	RAI-0025	RAI-0132
Standard Size*	57mm x 32mm puck	3/8" x 20 mesh	3/8" x 20 mesh	5/16" x 70 mesh
Packaging**	1000 lb open-head steel drums (55 gallon)	1000 lb open-head steel drums (55 gallon)	1000 lb open-head steel drums (55 gallon)	1000 lb open-head steel drums (55 gallon)

* Other sizes available upon request. ** Other packaging available upon request. Continuous product development may make it necessary to change product details without notice.

MASTER ALLOYS: SPECIALTY

Element %	50Al-50Co	50Al-50Cu	50Al-50Si	40Al-60Zr
Aluminum	47-53%	47-52%	Balance	39-45%
Cobalt	47-53%	--	--	--
Copper	--	47-52%	0.06% Max	--
Silicon	0.05% Max	0.25% Max	48-52%	0.40% Max
Zirconium	--	--	--	55-61%
Boron	--	--	0.01% Max	--
Carbon	0.06% Max	--	0.06% Max	0.10% Max
Iron	0.25% Max	0.50% Max	0.3% Max	0.40% Max
Lead	--	0.10% Max	--	--
Manganese	0.05% Max	0.25% Max	--	--
Magnesium	--	--	0.01% Max	--
Nickel	--	--	0.01% Max	--
Sulfur	0.005% Max	--	0.01% Max	0.005% Max
Zinc	--	0.10% Max	--	--
Nitrogen	0.05% Max	--	--	--
Oxygen	0.20% Max	--	--	--

RAI ID#	RAI-0040	RAI-0032	RAI-0098	RAI-0020
Standard Size*	5/8" x 5 mesh	30 mesh x down	1/4" x down	2 1/2" x down
Packaging**	1000 lb open-head steel drums (55 gallon)	800 lb open-head steel drums (17 gallon)	1000 lb open-head steel drums (55 gallon)	250 lb open-head steel drums (17 gallon)

* Other sizes available upon request.
** Other packaging available upon request.
Continuous product development may make it necessary to change product details without notice.

MASTER ALLOYS: SPECIALTY

Element %	Al-Ca-Mg	5Mg-95Ni	15Mg-85Ni	50Mo-50Ni
Aluminum	67-70%	--	--	0.050% Max
Calcium	10-12%	--	--	--
Nickel	--	Balance	Balance	47-51%
Molybdenum	--	--	--	47-51%
Magnesium	19-22%	4-6%	14-17%	--
Bismuth	--	0.0005% Max	0.001% Max	--
Boron	--	--	--	0.003% Max
Carbon	0.05% Max	0.05% Max	0.10% Max	0.050% Max
Cobalt	--	--	0.10% Max	--
Iron	0.20% Max	0.10% Max	0.20% Max	0.50% Max
Lead	--	0.001% Max	0.004% Max	--
Manganese	--	--	0.20% Max	0.010% Max
Phosphorous	--	--	0.01% Max	0.020% Max
Selenium	--	0.0005% Max	--	--
Silicon	--	0.15% Max	0.20% Max	2.20% Max
Silver	--	0.0005% Max	0.004% Max	--
Sulfur	0.005% Max	0.005% Max	0.01% Max	0.025% Max
Tellurium	--	0.0005% Max	--	--
Tin	--	--	0.004% Max	--
Zinc	--	--	0.004% Max	--
Nitrogen	--	--	--	0.015% Max
Oxygen	--	--	--	0.150% Max

RAI ID#	RAI-0038	RAI-0035	RAI-0036	RAI-0021
Standard Size*	10 x 50 mesh	ingot	ingot	5/16" x down
Packaging**	500 lb open-head steel drums (55 gallon)	500 lb open-head steel drums (17 gallon)	per customer request	500 lb open-head steel drums (17 gallon)

* Other sizes available upon request. ** Other packaging available upon request. Continuous product development may make it necessary to change product details without notice.

MASTER ALLOYS: SPECIALTY

Element %	Al-C-Ti (Codep)	50Mo-50Ti	53Si-47Ti	Al-Cr-Mo-Sn-Ti-Zr (Ti17)
Aluminum	33.5% Minimum	--	--	21-26%
Combined Carbon	4.8-5.6%	--	--	--
Titanium	Balance	48-52%	Balance	5% Max
Molybdenum	--	48-52%	--	21-26%
Silicon	--	--	50-55%	0.35% Max
Chromium	--	--	--	23-28%
Tin	0.10% Max	--	--	9-14%
Zirconium	--	--	--	8-13%
Acid Insoluble	1.80% Max	--	--	--
Ni+Mn+Cr+Fe	1.50% Max	--	--	--
Deposition Factor* **	13-15	--	--	--
Boron	--	0.01% Max	--	0.003% Max
Carbon	--	0.10% Max	0.10% Max	0.15% Max
Copper	0.10% Max	--	--	--
Iron	0.70% Max	0.50% Max	0.15% Max	0.45% Max
Magnesium	--	--	--	0.25% Max
Phosphorous	--	--	--	0.035% Max
Sulfur	--	0.01% Max	0.024% Max	0.02% Max
Tungsten	--	0.01% Max	--	--
Yttrium	--	0.01% Max	--	--
Hydrogen	--	0.05% Max	--	0.03% Max
Nitrogen	--	0.07% Max	0.30% Max	0.04% Max
Oxygen	--	0.40% Max	0.30% Max	0.10% Max

RAI ID#	RAI-0033	RAI-0068	RAI-0089	RAI-0026
Standard Size*	70 x +325 mesh	1/4" x down	20 mesh x down	3/8" x 20 mesh
Packaging**	40 lb open-head steel can (5 gallon)	1000 lb open-head steel drums (55 gallon)	500 lb open-head steel drums (55 gallon)	1000 lb open-head steel drums (55 gallon)

* Other sizes available upon request. ** Other packaging available upon request. *** Deposition factor = Al + 2.25 Combined Carbon - 0.56 Ti - 0.4 Fe
Continuous product development may make it necessary to change product details without notice.

Leader in Innovative and Advanced Metallurgical Technologies

Reading Alloys serves a wide range of applications such as aerospace, turbines, medical, electronics and others.

AMETEK Specialty Metal Products at a Glance

Reading Alloys is a unit of AMETEK Specialty Metal Products (SMP) operating within the Engineered Materials division of AMETEK Inc, a leading global producer of electronic instruments and electromechanical devices.

AMETEK SMP is a leading manufacturer of advanced metallurgical products including high purity powders, master alloys, precision metal tube, strip and foil.These products are manufactured at six operating facilities in the United States and the United Kingdom for a variety of critical applications, including aerospace, automotive, defense, electronics, energy, medical, general industrial and oil and gas.

A Tradition of Excellence

Reading Alloys was founded in 1953 on the principles of excellence in applied metallurgical research and development. We have always been driven by a commitment to research and technical expertise. Our adherence to our founding goals has enabled us to offer our customers a flexible range of technical options and R&D partnerships to meet the most demanding product requirements. This commitment has driven Reading Alloys to its current standing as a world leader in high-purity materials and technically advanced manufacturing and quality control processes.

ReadingAlloys
advanced engineered materials®

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