Company profile

Reading Alloys embarks on $7·2m expansion project

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To meet the market demand for high purity specialty powders, Reading Alloys will construct a new state-of-the-art 2300 m² (25 000 ft²) fine powder manufacturing facility at its corporate headquarters in Robesonia, PA. The company has about 170 employees and plans on creating 55 new positions within three years on this site.

About Reading Alloys

For over 50 years, Reading Alloys Inc. (RAI) has been a world leader in the research, development and manufacture of high grade master-alloys, specialty alloys, powder coatings and other engineered materials. The company supplies more than 60 standard alloy formulations in a wide range of sizes tailored to individual customer requirements. High purity alloys are manufactured in accordance with ISO 9001:2000 and AS 9100 and are certified and supported by an analytical laboratory that is Nadcap approved.

RAI serves the aerospace, medical device, electronic, sputtering target and other industrial markets while providing alloy development and technical support to its customers and is a supplier of several patented alloys to the metal casting industry and holds patents for other markets as well. RAI is a wholly owned subsidiary of KBAlloys Inc.

Production technologies

Product purity is vital to alloy performance. RAI utilises several leading edge production technologies to meet and exceed stringent industry specifications:

- a unique, single step aluminthermic smelting process
- induction melting and vacuum sintering
- cold isostatic pressing (CIP)
- electron beam (EB) melting and refining (Fig. 1)
- a hydride–dehydride (HDH) process
- a wide range of crushing, milling and screening processes.

Using these production technologies, RAI can manufacture a wide range of metal powders which include titanium (commercial purity), Ti–6Al–4V, Al–V, Al–Nb, Mo–Ti and Si–Ti powders.

RAI also offers a range of coloured conductive oxides for other coating applications.

Medical grade powders are certified to ASTM F1580-01 chemistry limits.

Hydride–dehydride process

The hydride–dehydride (HDH) process is used primarily for powder production and is a cost effective method for cp Ti and Ti–6Al–4V. HDH relies on the brittle nature of the corresponding metal hydrides. The alloys are hydrided, then milled and screened to produce fine powders (Figs. 2 and 3). After the powder has been sized, the interstitial hydrogen is subsequently removed using a vacuum heat treatment to produce finished metallic powders.

These powders are dense and angular in morphology, and can be magnetically screened and acid washed to remove any ferromagnetic contamination. Continuous development of titanium and other alloy powders has enabled RAI to expand into markets such as coating powders for orthopaedic medical devices, powder metallurgy and injection moulding applications.

1 High purity electron beam (EB) melted ingots, each weighing approximately 385 kg (850 lb)

Particle size distribution and powder applications

Particle size distribution (PSD) is an important powder parameter. Powders

2 Hydride–dehyride (HDH) unit

3 Typical three-deck screener used in production of titanium powders

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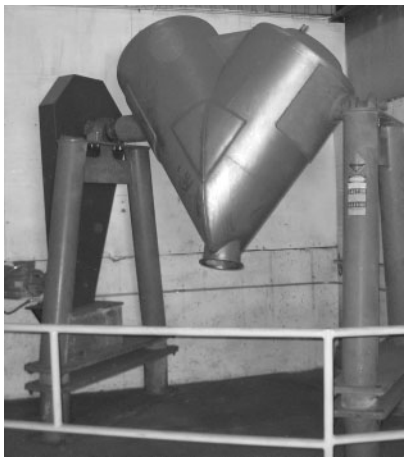
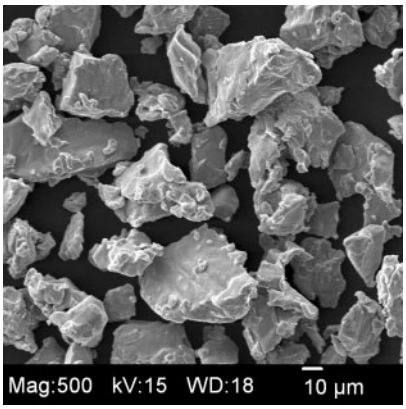


4 One of RAI's 450 kg (1000 lb) V-blend machines

supplied for powder metallurgy applications generally lie in the −150 μm size range and can be characterised using standard sieve sizes. For injection moulding applications, a finer PSD is required, in the −45 μm range. Laser diffraction techniques are preferred for the measurement of finer PSDs, and RAI offers both Microtrac and Malvern measurement techniques. It is also possible to physically manipulate the PSD by screening and blending to meet customers' specific requirements (Fig. 4).



5 Scanning electron micrograph image of typical HDH low oxygen cp Ti powder

RAI's low oxygen titanium powders (Fig. 5) have drawn interest from orthopaedic device manufacturers seeking cost-effective ways to fabricate near net shape titanium based PM components. Other industries expressing interest in these powders for PM processing include the aerospace, automotive and electronics sectors.

For example, Plansee GmbH, based in Lechbruch, Germany, depends on RAI's exceptional quality, high purity titanium and other alloy powders to meet specific requirements for its PM applications. Plansee is a global leading supplier of refractory metals and composite material products for several industries such as coatings, medical technology and electronics.

Scaling up with new manufacturing facility

The new 2300 m^2 state-of-the-art manufacturing facility will streamline the current manufacturing process and significantly increase capacity, with the installation of new production equipment. Key to this expansion programme will be the commissioning of several new HDH production units. This new facility will become an ideal powder manufacturing environment, housing highly specialised processes and equipment, separated from RAI's other alloy facilities. The project will support the construction of a state-of-the-art fine metal powder manufacturing facility that is in line with RAI's objective to enhance its position as a premier producer of high purity specialty powders.

For technical enquiries, contact technical.powders@reading-alloys.com or further information also available at www.reading-alloys.com.