

Custom Alloys for the Metallurgical Industry

Milward

Aluminum & Copper Master Alloys



Custom or Non-standard Alloy Products

As an experienced supplier of aluminum and copper-based alloys and additives, Milward employs its expertise to develop specialized alloys for the proprietary applications of our customers. We offer a full range of services including design, prototyping, testing and production. Finished product, from a few pounds to 1-1/2 tons, is provided in billets or slabs for industrial-scale production. As required, we will provide Non-Disclosure Agreements (NDA) to ensure full confidentiality.

Sample Applications

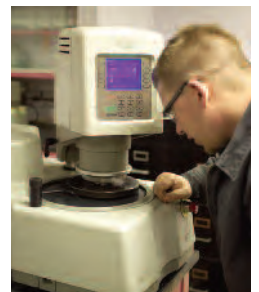
- Exotic welding alloys
- Nuclear shielding alloys
- Ultra-high purity aluminum for marine and aerospace (e.g. propellers, space shuttle)
- Automotive parts and components (e.g. motorcycle accessories)
- Peculiar alloys incorporating curiosity elements (e.g. gallium, indium, scandium)
- Other highly specialized or engineered master alloys and additives



Technical Services & Support

Milward can provide assistance in the metallurgical and chemical design of alloys and testing and analysis of the metallurgical and chemical composition of non-standard alloys. Analytical capability and quality control are supported by:

- Inductively Coupled Plasma (ICP) spectroscopy for chemical analysis
- X-Ray Fluorescence Spectrometry (XRF) - PPM level/99.9% composition level
- Scanning Electronic Microscopy (SEM) with Energy Dispersive X-Ray analysis (EDX)
- Optical Metallography





Beta Prototyping

Milward offers scale-up beta prototyping to produce an exact emulation of a production lot in a small quantity. Examples include:

- 7" diameter x 25" (18 cm x 64 cm) maxi-cast billet
- 6" x 18" x 72" (15 cm x 46 cm x 183 cm) DC cast
- Specialty alloy as a maxi-cast billet extruded into a simple round or square cross-section
- Small-batch alpha prototyping by melting a 110-lb. (50 kg) aluminum base alloy; includes de-gas treatment, filtration and Wagstaff maxi-cast of a 7" diameter x 22" (18 cm x 56 cm) Wagstaff billet that is fully representative of a large-scale production process



Production Capability

Milward Alloys operates a 73,000 sq. ft. complex, certified to ISO quality standards, to serve the needs of our customers for standard and custom alloys and additives. We also offer in-house and contracting services for heat treating cast forms with either rolling or extrusion as required.

Melting:

- Resistance
- Low-frequency induction
- Conventional linings
- Silicon-carbide crucibles

Casting:

- Static mold (2" x 4" x 36"/ 5 cm x 10 cm x 91 cm)
- Wagstaff maxi-cast (7" or 8"/18 cm or 20 cm diameter)
- Wagstaff DC cast (6" x 18"/15 cm x 46 cm)
- Unique semi-casting capability



DC Cast Slab

6" x 18" x 118"
 (15 cm x 46 cm x 300 cm)
 Borated Aluminum
 4.5% ¹⁰B in 1100 Alloy
 Weight = 1300 lbs. (590 kg)

Supplier of World Class Master Alloys Since 1948

Milward Alloys, Inc., is a manufacturer of hardeners, grain refiners, modifiers and deoxidants for the aluminum and copper melting industries. Milward's master alloys are precisely combined, melted, and packaged additives, made of primary metals and chemicals, designed to satisfy contemporary metallurgical needs.

As a world-class supplier of aluminum- and copper-based master alloys and additives, Milward recognizes that it is of primary importance to anticipate and fulfill the needs of its customers...and to continuously improve by integrating quality, innovation and excellence into our processes, products, service and technology.

Product Line & Custom Capabilities

In addition to the custom and non-standard alloys capabilities presented herein, Milward produces other precision alloying additives. For free literature and more information, request the specific bulletins below or visit our website (www.Milward.com).

Corporate Facilities & Capabilities

- Quality assurance process
- Environmental control
- Facilities & operations
- Research & development
- Mission statement & corporate values

Aluminum & Copper Master Alloys

- Aluminum master alloys for use as grain refiners, modifiers or hardeners.
- Beryllium-aluminum alloys for control of melt oxidation.
- Copper master alloys for use as deoxidants, alloying agents, wetting agents or hardeners.
- Precision Addition™ family of extruded aluminum master alloys.

Phosphorus-Copper

- 15% Phosphorus-Copper: three grades for use as a deoxidant, alloying agent or wetting agent.
- 8% Phosphorus-Copper: one grade for use as a nucleant.

Milward

Aluminum & Copper Master Alloys

Milward Alloys, Inc.

500 Mill Street • Lockport, NY 14094-1712 USA

Phone: 716-434-5536

Fax: 716-434-3257 • Toll-Free: 1-800-833-6600

E-Mail: milward@milward.com • www.Milward.com