



## IN THIS ISSUE

### President's Message

Beryllium Copper Provides an Advanced Material Solution

IBC Advanced Alloys Leads the Way with BeO Dual Oxide Fuel Research

Forging Ahead -- IBC's Forge Press Capability Leads the Way

Semi-continuous Billet Casting at IBC Freedom Alloys

## FOR DOWNLOAD

July 2009 Newsletter

## UPCOMING EVENTS

September 15 – 17, 2009  
**IEA International Workshop on Beryllium Technology**

The BeWS-9 is a workshop focusing on research and development of beryllium technology in fusion energy and fission applications.

**Almaty, Kazakhstan**

October 27 – 29, 2009  
**Louisiana Gulf Coast Oil Exposition 2009**

LAGCOE is one of the two largest petroleum industry conference in the US focusing on state-of-the-art technologies and the very latest in offshore and onshore drilling capabilities.

**Lafayette, Louisiana**

May 3 – 6, 2010  
**OTC Conference 2010**

Offshore Technology Conference (OTC) is the world's foremost event for the development of offshore resources in the fields of drilling, exploration, production, and environmental protection.

**Houston, Texas**

## President's Message

Welcome to the first issue of the IBC Advanced Alloys quarterly newsletter. Our objective is to keep our customers and shareholders up to date on IBC's progress and to provide an opportunity to learn more about our company. We also encourage communication with our subscribers and look forward to hearing any and all feedback regarding our products, service and ways that we may serve you better. IBC Advanced Alloys was formed in late 2007 to consolidate downstream manufacturing opportunities in the beryllium and advanced alloys sector, as well as to integrate across the mine to market value chain. Our initial objective was, and still is, to build a corporate platform to provide better service to our customers, to expand our product line and to develop new markets, new technologies and new opportunities for both IBC and our customers.

A second, but equally important component, of our business plan is vertical integration across the mine to market value chain to give us more control over our business objectives and corporate future. To this end, we have acquired significant mineral claims and resource assets in Brazil and the USA with significant land holdings in Juab County, Utah. We have also deepened an already strong relationship with our Central Asian processing partners, one of only two beryllium processing facilities in the world.

Since formation, we have focused on increasing and broadening our manufacturing operations by making a series of strategic acquisitions resulting in a profitable and strong downstream economic platform. We believe that our customers will be better serviced by our integrated operational divisions and enhanced production systems that are able to generate the highest quality and cost efficient products for your business.

Our first acquisition, Freedom Alloys, Inc. ("Freedom Alloys"), is based in Royersford, Pennsylvania. Freedom Alloys produces and supplies beryllium copper casting and master alloy ingot products globally. They also manufacture beryllium nickel, beryllium aluminum alloy products and can process a range of copper master alloys, used by foundries to produce copper alloy products, and copper-based alloys in billet and slab form, including beryllium copper alloys.

We then acquired Nonferrous Products, Inc. ("Nonferrous"), which manufactures forged copper, beryllium, copper and bronze alloys. Nonferrous, located in Franklin, Indiana, operates its proprietary forging and heat treating processes with one of the largest forging press in North America solely producing high-value beryllium, copper alloys and custom products. Nonferrous has recently added a large scale ring rolling mill to its production floor positioning it as one of North America's largest copper and copper alloy forged ring manufacturers.

In 2009, we acquired Specialloy Copper Alloys, LLC ("Specialloy"), an established specialty alloy manufacturer located in New Madrid, Missouri. Specialloy has significant unused manufacturing capacity which is being upgraded for expanded beryllium copper and other advanced alloys casting business that will expand and strengthen IBC's product offerings.

All three acquisitions are complementary and support each other with both production efficiencies and cost saving opportunities. With this integrated approach to our manufacturing operations, IBC has also realized additional benefits on a variety of human resource, accounting and marketing initiatives and is actively working on additional synergies that will allow us to provide better products and serve our customers more effectively.

Notwithstanding the past year's economic downturn and tumultuous marketplace, we believe our operational expertise in manufacturing beryllium-copper alloys and other advanced and master alloys, the



consistency of our products and the dedication of our employees guarantee our customers the most dependable and serviceable beryllium-copper and specialty alloy products available. IBC is in a uniquely strong and competitive position ready to expand on a multitude of opportunities and I look forward, working closely with the IBC team, to continue building value for all of our customers and stakeholders in the years to come.

*Anthony Dutton  
President and CEO*

[Back to Top](#)

---

## Beryllium Copper Provides an Advanced Material Solution

Advanced beryllium materials can solve critical performance problems across a wide spectrum of applications. At IBC Freedom Alloys, solving application-related problems with beryllium products and materials is a core customer service.



IBC Freedom Alloys has been producing beryllium containing alloys since 1994 at its Royersford, Pennsylvania manufacturing facilities. Production is primarily focused on beryllium copper alloy plate, rod, tube and ingot products.

Beryllium copper is an excellent advanced material for plastic injection mold tooling with performance characteristics superior to more commonly used tool steel alloys. Beryllium copper mold tooling provides significant performance benefits because of the material's inherent excellent thermal conductivity with high strength and hardness characteristics comparable to many tool steel alloys.

IBC Freedom Alloys recently solved a serious performance problem for a major tool fabrication shop complaining of manufacturing problems with a P-20 tool steel mold utilized to make a large 50 gallon recycling container. When the polypropylene material was injected, the container's corners and side panels were not within tolerance and exhibited significant form, fit and function issues. The engineers re-designed the mold inserting very large beryllium copper "big-blocks" up to 17 inches thick in strategic "hot-spot" locations in the tool to improve thermal conductivity and promote even cooling of critical surfaces.

To facilitate the fix, IBC Freedom Alloys was tasked with delivering 11 forged and machined beryllium copper 172-HH big blocks weighing almost 15,000 lbs. in three weeks. IBC Freedom's manufacturing capability to cast the 2MT BeCu input billets and have them processed to the large-scale block sizes allowed the new mold tool to be supplied to the customer in record time. The tooling engineers later reported that the entire container was molded in a single injection shot with perfect feature and dimensional control using the new beryllium copper production tool.

The redesign effort was a total success with IBC Freedom Alloys closely working with its customer, and using a beryllium copper alloy, to solve the problem!

[Back to Top](#)

---

## IBC Advanced Alloys Leads the Way with BeO Dual Oxide Fuel Research

Just beginning the second year of its multi-year, multi-phase project to develop a new type of advanced uranium oxide beryllium oxide (UO<sub>2</sub> - BeO) nuclear fuel, IBC Advanced Alloys, and their academic research partners Purdue University and Texas A&M University, are already looking to expand and accelerate this promising research. The objective of the project is to develop, for commercial use, an enhanced UO<sub>2</sub> - BeO nuclear fuel that is longer lasting, more efficient and safer than current nuclear fuels for both current and future nuclear power reactors.



Existing work by Purdue nuclear engineers has shown that UO<sub>2</sub> - BeO nuclear fuel could potentially save billions of dollars annually by lasting longer and burning more efficiently than conventional nuclear fuels while at the same time dramatically impacting the demand for beryllium (Be) and beryllium oxide (BeO). In addition to significant cost savings, an advanced UO<sub>2</sub> - BeO nuclear fuel could also contribute significantly to the operational safety of both current and future nuclear reactors due to its superior thermal conductivity and associated decrease in risks of overheating or meltdown.

Dr. Shripad Revankar, a professor of nuclear engineering at Purdue, is leading the research project with Dr. Sean McDeavitt, an assistant professor of nuclear engineering at Texas A&M University, assisting. In addition, Dr. Alvin Solomon, a professor emeritus at Purdue's School of Nuclear Engineering, and an early pioneer in the field of high thermal conductivity nuclear fuels, acts as a consultant to the project and has been appointed chair of the IBC Nuclear Fuels Advisory board. Drs. Solomon, Revankar and McDeavitt are leaders in the field of advanced nuclear fuels research and have published extensively in a variety of peer-reviewed scientific journals and presented at a number of international nuclear fuels symposiums and conferences.

To promote its research work, IBC Advanced Alloys and Texas A&M University, working jointly with Purdue's School of Nuclear Engineering, recently attended a Light Water Reactor Sustainability ("LWRS") workshop in Atlanta, Georgia. Representatives were present from the national labs in Argonne, Idaho, Oak Ridge, Sandia and several educational institutes including Texas A&M, MIT and the University of Florida. Also attending were major energy utilities including Duke Power and TVA as well as the leading fuel manufacturers, Westinghouse and AREVA.



"We are very pleased with the progress of this joint research initiative," stated Ken Shasteen, IBC's Technical Director and coordinator of IBC's joint nuclear fuels research project. "Presenting at the LWRS was valuable, as all significant groups representing the nuclear power industry were in attendance and validated the premise that multi-oxide and BeO fuels will be the foundation of a more efficient, economically sound and safer nuclear power industry. We look forward to discussing our technology with the attending groups," continued Shasteen, "as we work to develop a commercial UO<sub>2</sub> - BeO nuclear fuel for the benefit of our shareholders, power consumers and the nuclear power industry."

[Back to Top](#)

## Forging Ahead - IBC's Forge Press Capability Leads the Way

IBC Advanced Alloys' Nonferrous Division has been forging copper alloys for almost 50 years. The heart of Nonferrous, and has been for more than 10 years, is a 1,500 tonne open-die hydraulic forging press. Power is supplied to the press by three 500-horsepower electric motors driving six pumps. This tremendous power makes it one of the largest fast-acting presses in the world that is dedicated solely to the forging of copper based alloys. The two position lower die slide allows for a quick-change from a large flat upset-die to a 16" x 42" draw die. This feature facilitates the production of high quality upset and cross-grain forged products in a variety of shapes with weights of up to 4,500 pounds. The press-forged products produced include plates, blocks, discs, rings and rods.



The forging press is operated by a two-person crew, with one person operating the press from a console in the control booth, while the other positions and moves the forging stock on the dies with a forklift mounted manipulator. At times, an additional person is needed to use a manipulator to assist with unusually long or awkward shapes. Preheating of the input stock is done in one of two large gas-fired furnaces. These furnaces are also utilized in heat treating operations subsequent to forging.

The forgings produced with this press are all copper or copper based alloys, including high conductivity red metals such as beryllium copper, chromium copper and nickel-silicon copper. The press is also used to produce high strength and corrosion resistant alloys such as aluminum bronze, nickel aluminum bronze and copper-nickel.

A recent forging press customer, Mike Holland, Sales Manager for Southern Copper & Supply Company, Inc. states, "The flexibility in production capability of the Nonferrous press makes them a 'one stop shop,' when I purchase my forged rings and plate."

The forge press serves specific industries, such as resistance welding, plastic mold tooling, power

generation, steel production, oil and gas exploration, heat exchanger, electronics, marine, defense and others, that require copper or copper alloys because of a need for increased electrical or thermal conductivity or for superior corrosion or wear resistance that steel cannot provide. The use of copper and copper alloy forgings will continue to increase as technology develops and expands in these fields.

[Back to Top](#)

## Semi-continuous Billet Casting at IBC Freedom Alloys

Semi-continuous billet casting ("SBC") is a core competency of IBC Freedom Alloys. Our billet production facility uses the finest purpose built equipment available, operated by an experienced and knowledgeable staff, to produce a continuing stream of world class semi-continuous cast billets.

IBC Freedom production billet casting began in 2001 with a single size and alloy and has continued and grown in both the number of alloys cast as well as the number of billet diameters produced. This trend is still continuing with additional billet diameters and alloys planned for upcoming production. Seven different alloys are currently cast as billets in several different diameters with more alloys planned for the near future in additional diameters. IBC Freedom is working hard to develop its range of billets to meet the increasingly sophisticated and diverse needs of the market.

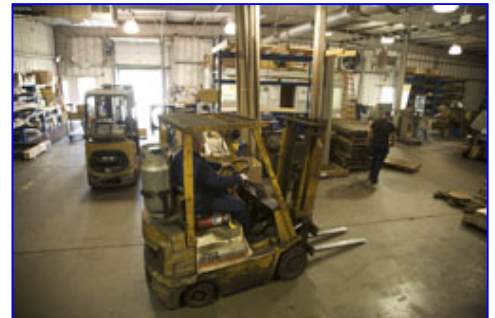


Billet casting quality and uniformity is a critical factor to the ultimate production of downstream products produced by forging and or extrusion. Without quality input material, it is not possible to produce a consistent output product. This is the classic garbage in garbage out scenario. You cannot make good finished products without quality starting material. It was the long standing IBC Freedom reputation for quality casting ingots that prompted forgers and extruders to request that our cast product line be expanded to include high quality semi-continuous cast billets. IBC Freedom accepted the challenge, and now produces world class billets for both forging and extrusion.

Semi-continuous billet casting (SBC) has many critical design elements and process parameters that must be addressed in order to produce a consistent and superior product. The design elements and process parameters include:

- Elevator system
- Mold design
- Water cooling and filtration system
- Instrumentation
- Metal metering system
- Documentation and data analysis

IBC Freedom Alloys takes billet casting seriously and is very proud of its work and high customer satisfaction levels. IBC Freedom is customer focused working closely with our end users to supply the highest quality material possible. Our unique purpose built equipment, state of the art casting processes and dedicated staff form a solid and ongoing foundation for the continuing production of world class semi-continuous cast billets.



[Back to Top](#)