Almex Excel™ Billet Casting System

EXCEL

Meeting the Needs of the Aerospace Industry and Beyond

At Almex we understand that a versatile billet casting system is key to the success of any casthouse. We have used our comprehensive understanding of the DC casting process, metallurgical properties, mechanical design and modern manufacturing methods to develop a casting system that offers exceptional safety, productivity and value.

Unlike other casting systems, the Almex Excel Billet Casting System was designed to effectively handle both hard alloy, large-diameter billets required by the aerospace industry, as well as conventional alloys and sizes for more traditional alloy applications. Almex systems are simpler, cleaner, more flexible and more cost-effective to own and operate than any other casting system in the world. And we partner with you to configure a billet system that will meet your exact specifications.

Our commitment doesn't end once your equipment is commissioned. Almex provides the technical know-how for effective billet production. We focus on the entire melting and casting process, and guarantee the results of the billet.

Primary System Components

- **Mold Tooling —** Using level-pour (hot-top) technology, molten aluminum flows from a distribution launder into water-chilled molds, solidifying the metal into the desired billet shape. Almex uses relatively short molds, resulting in rapid cooling that enhances billet metallurgical properties.
- **Mold Table —** Almex billet mold tables are fabricated from structural steel plate and stainless steel rectangular tubing. The internal passages are painted with an epoxy coating to prevent corrosion resulting from the continual presence of water.
- **Molten Metal Distribution Launder —** Sized for the specific molten metal flow rate, the Almex distribution launder allows varying launder cross sections, minimizing heat loss, and maintaining uniform metal temperature and fill rate for all molds.
- **Starting Head Base —** The starting head base is fabricated from heavy structural steel plates and wall pipes for maximum strength and rigidity. The assembly is stress-relieved prior to machining, and after fabrication is thoroughly cleaned, sandblasted and painted to provide the best in durability, corrosion protection and molten metal contact protection.

The Almex Excel Billet Casting System was designed to effectively handle both hard alloy, large-diameter billets as well as conventional alloys.

Achieving excellence in aerospace alloy metal treatment and casting has made Almex the leader in DC casthouse technology.

ALMEX
Integrated Casthouse Solutions

Our systems are simpler, cleaner, more flexible and more cost-effective to own and operate than any other leading casting system in the world.

Primary System Components (cont'd)

- **Starting Heads —** Almex starting heads are designed using state-of-the-art 3-D modeling software and are machined with accurate cavities and external dimensions on computer-controlled machining centers. This guarantees concentric casting of the billets. A specialized starting head is available for hard alloy and large-diameter billet casting.

Almex Optima™ Billet Molds — Designed for High Productivity and Effective Operation

Almex Optima Billet Molds are specially configured for casting hard alloys with long freezing range and common alloys — a major step ahead of traditional hot-top DC casting systems. The combination of mold design and casting practices results in high recovery of hard alloy billet in sizes up to 42 inches (1042 mm) in diameter.

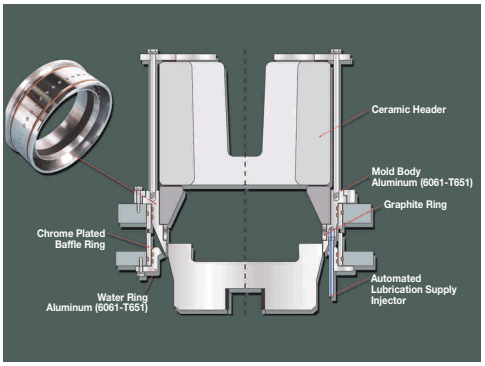
The following are typical design parameters:

Design water flow of the mold	0.75 to 1.75 gallons per minute per lineal inch (1.18 to 2.60 liters per minute per lineal centimeter) of mold bore perimeter
Design water supply pressure	10 to 12 psi (0.69 to 0.83 Bar) at entry to mold table (or at manifold between mold table and frame)
Water chemistry requirement	pH: 7.5 to 8.6
Total dissolved solids	1000 ppm maximum
Length of graphite ring (typical)	0.810 inch (20.6 mm)
Mold design	"Water Hole Type" for diameters 10 inches (254 mm) and over "Water Curtain Type" for diameters less than 10 inches (254 mm)
Billet diameter ranges	3 inches to 42 inches (75 mm to 1042 mm)
Metal depth in reservoir header	5 inches +/- .5 inch (127 mm +/- 12 mm)
Grain size and liquation depth	Data for all alloys and sizes are available from Almex
Alloy range	6xxx, 2xxx, 7xxx

Features

Billets produced by Almex Excel Billet Casting Systems meet the most stringent production requirements and have the following properties:

- **Thin inverse segregation zone**
- **Fine grain structure**
- **Straight and true geometry**
- **Uniform diameter**
- **Optimal inter-dendritic spacing**



Almex Optima™ Billet Molds are designed for close spacing allowing a maximum number of strands. The modular design allows easy change-out of consumable parts. Convenient access to mold components allows easy maintenance.

For over 15 years, Almex USA has been providing fully integrated casting solutions to aerospace suppliers and common alloy producers. Our proven technical expertise, unique end-product guarantee, and focus on the entire melting and casting process, have made Almex a leader in DC casthouse technology.

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Integrated Casthouse Solutions

Almex USA, Inc.
6925 Aragon Circle, Unit 10
Buena Park, CA 90620 USA
Tel: 714.739.0303
Fax: 714.739.0404
www.almexusa.com