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Metals Trivia:

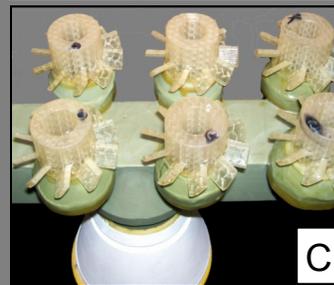
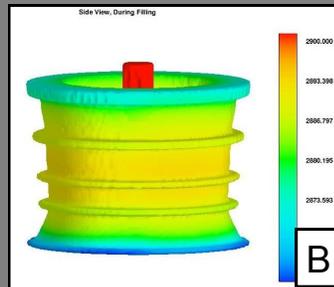
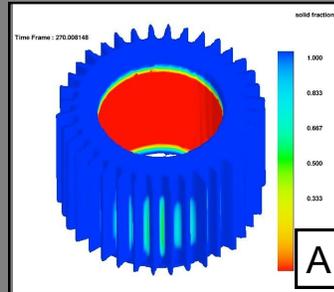
- Harry Brearley is credited with having discovered stainless steel. Legend is that he noticed that a piece of experimental metal on the scrap pile had no rust, and took it from there.
- The world's first iron bridge is in a town called Ironbridge (!!) near Coalbrookdale in England.
- Calvin Coolidge was the first and only United States President to have his portrait appear on a coin minted while he was living.
- Americans use about 80 billion aluminum cans per year.
- Speaking of coins, if you have three quarters, four dimes, and four pennies in your possession, you have the largest possible amount of money in U.S. coins without being able to make change for a dollar.

INTEGRATED CASTING MANUFACTURING

Often, design and procurement professionals limit options for metal shaping technologies based on some well-earned historic paradigms. The assumption is that prototype and low volume parts must be "hogged" from a large block of material. The entire design approach is driven by this limitation. However, Advanced Casting Technologies (ACT) have virtually eliminated the need for high priced hog-out manufacturing. Integrating computer simulations with rapid prototyping techniques produces accurate representation of the design at the highest quality level, using the most cost-effective process.

These Advanced Casting Technologies simply require the customer to provide a 3D computer solid model in a typical format (.igs, .stp, Parasolid, etc.), along with quality level expectations and identification of critical features. With ACT, the model and information provided by the designer is directly integrated into tooling and process engineering.

Solidification modeling (A) is widely used in both high production and job-shop foundries or prototype environments. With proper calibration of the process variables and physical properties that impact manufacturing, the process is a very accurate predictor of the final product. Even greater accuracy is afforded with the integration of programs (B) that accurately simulate the filling of the mold



The result of the upfront simulations is used to create a new computer model of the casting complete with all associated feeders, gates, and chills. This information is used to manage the manufacturing parameters that will ensure creation of a quality product built to the customer's requirements. The data is transferred to the next step in the process – tool building or rapid prototyping.

Tool building using ACT integrates the newly created model directly into tooling production. Use of highly accurate CNC machines to cut metal and stable composite materials, combined with foundry experience, reduces dimensional variability in tool construction. Rapid prototyping from the model can involve construction of O.D. shaping methods for centrifugal casting, stereo lithography models (C) for investment casting, and foam or direct sand-machined molds (D) for sand casting. In most of these cases, the mold construction cost is fractional compared to the cost of hard tooling and lead times are decreased.

Finally, the original model can be used to create a layout plan for dimensional verifications that can range from traditional contact CMM layout to advanced layouts using laser scanners (E), that can generate point clouds referenced directly to the designer's model.

cavity with molten metal. This can allow the foundry to predict concerns that could develop during the manufacturing process in advance, and optimize the mold filling or rigging.