Metal Additive Manufacturing

Customization. Small lot production. Prototypes. For a manufacturer, these terms are generally associated with expensive, wasteful, and time consuming. But additive manufacturing is changing this.

Additive manufacturing, a term used to describe numerous methods of building a material or product layer by layer, and with high precision, offers manufacturers an opportunity to produce one-of-a-kind products at a price point and delivery time similar to large lot manufacturing. This trend is garnering particular attention in the metal additive manufacturing arena—primarily due to the huge demand for "lightweighting"—or making traditional products lighter to reduce fuel needs in the transportation and other industries.

But metal additive has many other potential benefits to the manufacturing industry such as customization in the orthopedics industry and rapid production of patterns for metal castings, in-field repair of damaged components, and low-volume production of specialty and hard-to-find parts.

Researchers at Lawrence Livermore National Laboratory are embarking on new research that will transform manufacturing processes by introducing metal additive manufacturing with the ultimate goals of reducing material waste, cost, manufacturing footprint, and significantly reducing the time required to manufacture parts. Additive manufacturing equipment is, by its nature, ideal for achieving these goals.

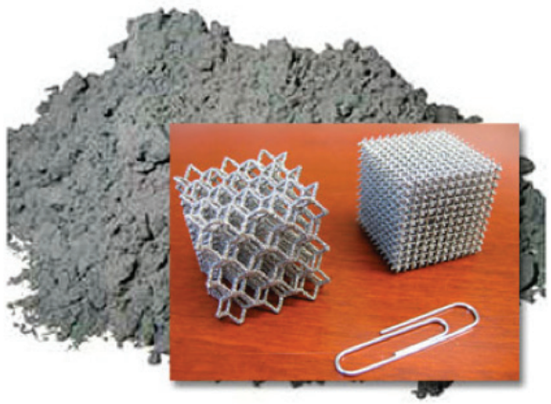

Photo Credit: NIST.gov

(above) Metal powder and resulting product using laser powder bed equipment. (below) DMLS, one of several metal additive techniques, leads to light-weight, low-production volume parts .

Photo Credit: GKN Sinster Metals

Upcoming LLNL research areas:

- Producing dense metal components
- Improving metal additive techniques to reduce residual stresses in products
- Improving techniques for surface finish
- Producing complex geometries with laser powder bed equipment

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This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

LLNL-MI-577652

Lawrence Livermore National Laboratory