



## Manufacturing Methodology

Manufacturing systems and processes built on Lean Six Sigma manufacturing and just-in-time principles

## Tons, Not Grams

Industrial scale manufacturing environment with production capacities exceeding 150 metric tons on a dry-weight basis

## State of the Art Manufacturing

Industry-leading, low capital intensity manufacturing systems that are designed for precision, repeatability and robustness

Cerion understands that our customers need access to nanoparticles that are cost-effective at pilot and industrial scale volumes. To support these needs, we have progressively expanded our production capacity from its original 5 metric tons per annum years ago, to over 150 metric tons per annum today. Both our process and our purpose center around ensuring we deliver on the quantity, quality, performance and price parameters required by our customers, along with their desired time to market.

### Lean Manufacturing

Built and operated using six-sigma and lean manufacturing principles, our facility has been designed to be both efficient and nimble with quality and scalability as our primary goals.

### Industrial

The design of our manufacturing processes exclusively leverages industrial scale chemical processing equipment and components readily available on the commercial market. Supplementing these manufacturing systems are specialty on-line and off-line systems engineered by Cerion to add process capabilities unique to our industry and customer's needs.

Today, Cerion boasts the lowest capital and energy intensity per metric ton of capacity on the market when compared to its competitors and is well positioned to rapidly build new manufacturing lines as required by customer demand.

### Scale

Our facility supports various levels of pilot production for nanomaterial prototyping and qualification, as well as industrial scale manufacturing. Our system design allows us to scale-up, scale-down and rapidly reset between manufacturing runs.

### Quality

Since providing quality and consistency in production is paramount, we incorporate a number of controlled processes. We start with a high level of Quality Assurance (QA) for raw materials and continue Quality Control (QC) throughout the manufacturing process — during and after the production of the nanomaterial. This process ensures that not only the first batch of material achieves the customers' material specifications but ensures high repeatability time and time again.

# WE GET IT.

Developing in-house advanced expertise in nanomaterials is expensive and time intensive. That shouldn't stop you from utilizing them to improve your products.

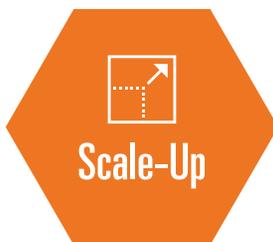
## Cerion Nanomaterials Can Help

As a global leader in designing, scaling and manufacturing custom nanomaterials for industry, Cerion provides the expertise and materials you require, while your team stays focused on advancing the development and delivery of your products and systems.



### Design

Precision design and customization of both nanoparticle size and technical attributes



### Scale-Up

Robust processes to scale materials from prototype to low and high-volume production rates



### Manufacturing

Industry-leading, cost-effective manufacturing systems and production capacities

## Our Material Expertise

Cerion has a breadth of experience across a range of material systems. These include material classes such as metals, metal oxides and ceramics:

- Barium
- Boron
- Ceria
- Cobalt
- Copper
- Gold
- Iron
- Nickel
- Niobium
- Palladium
- Platinum
- Silica
- Silver
- Titania
- Tungsten
- Yttrium
- Zinc
- Zirconia
- And more...

## Synthesis Methods

We are proficient in precipitation, high energy milling, conventional spray drying and high temperature combustion.

## Dedicated In-House Analytical Team

We have our own fully-staffed analytical department along with a full suite of state-of-the-art equipment for the characterization of nanomaterials.

## Customers

Experts in product & system development seeking to leverage nanomaterials to enhance performance



## Cerion

Experts in providing nanomaterials to support customer requirements — from research through manufacturing

Ready to learn more? Visit [www.cerionnano.com](http://www.cerionnano.com)

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