

Company Reports Banner Year for ALD Technology, Helping Fast-track Advanced Materials

We are pleased to send you the inaugural ALD Nano Enews. Today's edition is focused on our press release announcing new intellectual property, expansion of our Colorado facility and team, and recent commercialization partnerships with Fortune Global 500 companies. Tap below to link to coverage of our story and our full press release is also shown below.

MarketWired

ALD Nano News

ALD NANOSOLUTIONS REPORTS BANNER YEAR AS ITS ATOMIC LAYER DEPOSITION (ALD) TECHNOLOGY HELPS FAST-TRACK ADVANCED MATERIALS FROM CONCEPT TO COMMERCIALIZATION

Company expands portfolio of high-value IP; deepens engagements with customers; doubles manufacturing space, and adds new reactors to increase production capacity at Colorado HQ

BROOMFIELD, Colorado – Nov. 4, 2016 – Today, ALD NanoSolutions (ALD Nano), the pioneer and market leader in [Atomic Layer Deposition](#) (ALD) technology on particles, reported a banner year on multiple fronts. The company partners with leading global materials companies to commercialize ALD advanced materials that significantly improve the performance, safety and other characteristics of end products in industries like lighting, batteries, sensors, life sciences and catalysts. 2016 highlights include new patents, deeper customer engagements, expanded manufacturing space, and new reactors to increase production capacity. The momentum illustrates how ALD Nano is harnessing the immense near-term market opportunities for its proprietary ALD technologies outside of ALD's traditional deployment in the semiconductor industry.

Leading with Differentiated Intellectual Property (IP)

Major 2016 milestones reinforced ALD Nano's pioneering development and leadership in ALD for control of surface properties at the atomic level for unique functionality of particles and other materials. The company obtained new patents, including some from the University of Colorado Boulder (CU Boulder), its R&D partner since inception. This brings ALD Nano's total patent holdings to 28 issued and 14 pending. The new IP heightens the market value and cost-effective use of

its “Particle ALD” and “Polymer ALD” to create advanced materials.

An important new patent¹ covers an ALD method to deposit inorganic films on organic polymer surfaces. For industries like OLED displays and lithium-ion batteries, the innovation promises breakthrough benefits that could displace other technologies. The Polymer ALD technology could better protect battery electrode separators from overheating and enable next-generation life-science tools, among other applications.

Another new patent² is for Particle ALD use with super capacitor electrodes, and an in-license³ from CU Boulder for additional applications of ALD for batteries. Together, they strengthen the company’s position in the energy storage market. A further patent⁴ covers the use of an ALD method to apply a ceramic coating to implantable medical devices. This expands ALD Nano’s position in the life sciences industry. The company also filed a patent⁵ internationally for its revolutionary Particle ALD continuous flow reactor system. This allows for large-scale, cost-effective Particle ALD advanced materials production.

Enabling Innovation for Manufacturers of Lithium-Ion Batteries and LED Lighting

A standout 2016 highlight was the first commercial application of Particle ALD for Cathode Active Materials (CAMs) used to produce lithium-ion batteries. The breakthrough was achieved thanks to CU Boulder’s extensive R&D and ALD Nano’s proprietary and robust IP portfolio, coupled with the company’s strategic partnership with a leading battery materials company. Particle ALD is the most effective surface modification method available for CAMs. The ALD-enabled CAMs will dramatically improve performance, extend cycle life and enhance the safety of batteries for use in consumer electronics, electric vehicles and grid storage.

Also in 2016, the company began commercial production of Particle ALD phosphors for a Fortune Global 500 customer, following a multi-year collaboration. The ALD advanced material significantly extends the brightness lifetime for LED lights, while using a fraction of the coating material required for other deposition methods.

Expanding Infrastructure to Address Growing Demand for ALD Solutions

With its accumulating IP, ALD Nano is expanding and deepening engagements with customers. To support the momentum, the company doubled manufacturing space at its headquarters in Colorado, and added new reactors to increase production capacity. Headcount has also grown in the last 12 months.

CEO Mike Masterson called 2016 a transformative year for ALD Nano: “Our growth this year coincides with the consistently superior performance of our ALD technology in many markets. This validates our early vision and is now guiding our execution strategy to create ALD advanced materials in partnership with leading sales channel partners and customers. We’ll enter 2017 firmly positioned with differentiated technology and expertise to help such companies achieve their technology and cost-of-production goals. Our growth is a tribute to the steady efforts of our team, and the extraordinary innovation contributed by each individual.”

New ALD Nano Patents

¹ US Patent 9,376,750

² US Patent 9,406,449

³ US Patent 9,196,901

⁴ US Patent 9,279,120

⁵ US Application 62/175,964

About ALD

ALD is the sequential vapor phase material deposition method that forms chemically bonded, high-purity, conformal, ultra-thin films of controlled nanometer thickness. ALD generates less waste than other deposition techniques such as chemical vapor deposition, giving customers a sustainable and cost-of-ownership edge, while helping to reduce overall costs. The atomic level precision of ALD on particles, polymers and other substrates enables new or better applications of materials resulting in ALD advanced material solutions. Devices such as consumer electronics are getting smaller and more complex, requiring novel materials to solve critical issues for marketplace adoption.

About ALD NanoSolutions

[ALD NanoSolutions](#) (ALD Nano) is creating cost-effective advanced materials that are transforming industries such as lighting, energy storage, consumer electronics, life sciences, fuel catalysts, water purification, sensors, and more. We're the leader in Atomic Layer Deposition (ALD) technology on particles, with broad IP covering polymers and MEMS, as well. We partner with world-leading companies that leverage our material designs and reactor systems to innovate products that benefit consumers globally. For more than a decade, we have commercialized innovative ALD technologies developed internally and through research conducted at the University of Colorado Boulder. We're headquartered in Broomfield, Colorado. www.aldnanosolutions.com.

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