



Serving the Advanced Materials Needs of Customers Worldwide

[www.neicorporation.com](http://www.neicorporation.com)



## COMPANY VISION

To become a world leader in developing and supplying advanced materials.

## ABOUT US

NEI Corporation is an application driven company that utilizes nanotechnology to develop and produce advanced materials. The company's core competencies are in synthesizing nanoscale materials and prototyping products that incorporate the advanced materials. Founded in 1997, we manufacture and sell advanced materials products, provide materials development services, and perform contract-based R&D for public and private entities. NEI has built a strong manufacturing and R&D infrastructure that enables rapid transition of concepts to products.

NEI's products, which are sold under the registered trademark NANOMYTE®, are backed by a suite of issued and pending patents.

## FACILITIES

NEI Corporation has a 10,000 square foot, state-of-the-art materials manufacturing and testing facility in Somerset, New Jersey. Highlights include high temperature furnaces with controlled atmospheres, mixing, blending and drying equipment, coaters, particle characterization instruments, corrosion testing equipment, polymer films & coatings characterization, and a Li-ion battery testing laboratory.

## PARTNERS

Since its inception, NEI has partnered with small companies, large multinational corporations, U.S. Defense Laboratories, U.S. National Laboratories, and Universities. The relationships take on different forms, ranging from a strategic partnership to joint development efforts targeted at specific applications, or collaborations on funded, long range projects. NEI has developed situation-specific models for win-win partnerships.

# PRODUCTS

## Advanced Protective Coatings

NEI offers an array of Advanced Protective Coatings for metal, polymer, and glass surfaces. Our NANOMYTE® line of specialty coatings provide tailored functionalities, such as anti-corrosion, self-healing, ice-phobic, easy-to-clean, and scratch resistance.



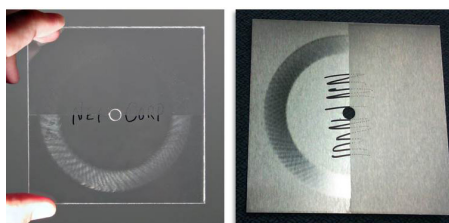
### ▲ Abrasion Resistant Coatings

NANOMYTE® Hardcoats form a ceramic-like hard surface on various substrates, fulfilling the need for abrasion and scratch resistance in a variety of applications, such as ophthalmic & sportswear lenses, automobile, and airplane windows.



### ▲ Coating Additives

NEI's NANOMYTE® line of coating additives are designed for use in urethane, epoxy, and silicone formulations. With only a small additive loading, abrasion resistance, tear strength, and wear resistance of a variety of coatings can be dramatically improved.



### ▲ Easy-To-Clean Coatings

NANOMYTE® SR-100EC is a transparent, micron-thick coating that provides both scratch resistance and easy-to-clean properties to surfaces. The surface

treatment is mechanically robust, is highly repellent to water and oils, and it enhances lubricity. Soil and liquids simply slide off the surface of components coated with SR-100EC, thereby helping prevent deposits and extending the time between cleanings.



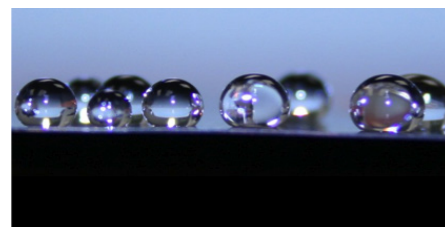
### ▲ Self-Healing Coatings

NEI has developed a new class of self-healing polymer nanocomposite coatings that heal both surface scratches and mesoscopic damage (e.g., micro-cracks and cavitation). NANOMYTE® MEND self-healing, clearcoat technology provides a durable, long lasting finish for metal and wood substrates. The self-healing functionality allows for a high degree of scratch repair and gloss recovery, even in repeatedly damaged areas.



### ▲ Anticorrosion Paints & Coatings

NANOMYTE® pretreatments, primers, and topcoats are an innovative drop-in solution for your metal finishing applications – whether it's preserving aesthetic appearance or maintaining structural integrity. Formulations apply easily to metal substrates by immersion, spray, wipe or brush, even in the field, without special equipment or surface preparation.



### ▲ Superhydrophobic Coatings

NEI's line of NANOMYTE® hydrophobic coatings provide durable protection from abrasion and liquids and can be applied to a variety of substrates, including plastics, metals, glass, painted surfaces and fabrics. The coatings are applicable to industrial condensers in general and, more particularly, surface condensers in power plants. They can also be used to impart anti-fouling and easy-to-clean properties to the metallic surfaces of a variety of commonly used consumer products.



### ▲ Customized Coatings

NEI provides advanced materials development by combining our intellectual property and technical expertise to develop a coating that suits your application's needs. We create a customized coatings solution to meet your requirements through a structured approach involving specified milestones. We will work with you from initial R&D all the way through large scale manufacturing. Your intellectual property rights are fully protected at all times.



## PRODUCTS

### Li-ion Battery Materials – Cathodes, Anodes, and Electrolytes

#### **Cathode, Anode, Electrolyte Powders and Cast Tapes (Films): Nanoparticles and Micron-sized particles**

NEI Corporation is a leading developer and manufacturer of Lithium-ion battery materials and supplies cathode, anode, and electrolyte materials for use in lithium-ion batteries.



We produce battery materials through our scalable and economical solid state and solution synthesis processes, which is adaptable to different materials compositions and particle morphologies. Both, lithium-ion battery developers and manufacturers work with us to obtain cathode, anode and electrolyte powders that are ideally suited for their application. NEI also specializes in custom synthesis of lithium-ion cathode, anode and solid electrolyte powders to impart safety, high capacity, long cycle life, high rate and good low temperature performance.

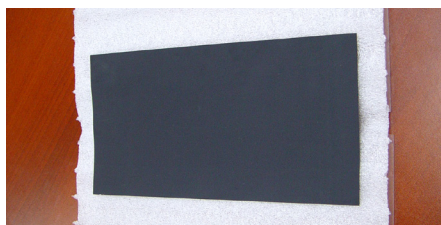
In addition to supplying standard cathode and anode compositions, such as lithium titanate, lithium manganese oxide, and lithium manganese nickel oxide (spinel) in both powder and cast tape forms, we can custom produce any lithium battery material composition of your choice – oxide, sulfide, and carbon-coated.

NEI also has an extensive in-house capability for assembling and testing lithium-ion coin cells and lithium-ion pouch cells. Customers developing new materials and process technologies especially benefit from these battery fabrication and battery testing services.



#### ▲ Cathode & Anode Powders

NEI Corporation offers a variety of cathode and anode powders with flexibility in modifying the composition, particle size, size distribution and particle's surface area



#### ▲ Cathode & Anode Tapes

NEI Corporation offers a variety of cathode and anode electrode tapes, cast on a current collector (e.g. Al, Cu). The tapes can also be custom-made in terms of active loading/binder/conductive agent content and tape thickness.



#### ▲ Solid Electrolyte

NEI's patent-pending, solid electrolyte material, lithium tin phosphorous sulfide ( $\text{Li}_{10}\text{SnP}_2\text{S}_{12}$ ) is designed to eliminate flammability issues associated with currently used liquid electrolytes, while providing high Li-ion conductivity. Additionally, we can custom produce various solid electrolyte material compositions – both oxide and non-oxide (e.g., sulfide-based).

## PRODUCTS

### Heat Transfer Fluids



NEI supplies heat transfer fluids engineered with nanoscale particles for demanding cooling applications. NANOMYTE® ThermoDon-1 is an efficient heat transfer fluid for applications where water is used as coolant. NANOMYTE® ThermoDon-2 is a high performance synthetic gear oil additive containing proprietary, nanostructured particles which dramatically improve heat transfer, typically resulting in a significant reduction in gearbox operating temperature.

### Sorbents For Mercury Removal



#### ▲ Sorbents For Mercury Removal From Water

NANOMYTE® MerGon FP and AG are carbon-based, high efficiency sorbents that remove mercury from contaminated water. The sorbents can be used in filter cartridges or can be incorporated into fabric filters. The sorbents can reduce mercury concentration down to < 2ppb.



#### ▲ Sorbents For Mercury Removal From Flue Gas

NANOMYTE® MerGon-FG is a non-halogenated and concrete friendly alternative to brominated activated carbon for mercury removal from flue gas. The sorbent is activated carbon-based and does not use any metal as catalyst. The performance of MerGon-FG is similar to or better than commercial brominated sorbents. The patented technology used to manufacture MerGon-FG can be used to modify any coal or coconut-based activated carbon to improve its mercury adsorption capacity.

## Services

### Materials R&D Services

Partner with us for advanced materials development, specifically for your application. We combine our intellectual property and technical expertise to develop a material that suits your application's needs. We create a custom materials solution to meet your requirements through a structured approach involving specified milestones. We will work with you from initial R&D all the way through large scale manufacturing. Your intellectual property rights are fully protected at all times.

### Characterization & Analysis

NEI's **Materials Analysis, Testing, & Characterization** service, or **MATCH**, (formerly Nanotech Analytics) offers comprehensive materials characterization and analysis, specializing in the nanoscale level. As a leading developer and manufacturer of nanotechnology-based materials, we leverage our vast experience and knowledge in nanoscale materials to help our customers in analyzing and helping attain their materials goals. Our expertise and state-of-the-art equipment enable us to satisfy all of your testing needs with excellent precision at a competitive price and in a timely manner.

### Technology Commercialization

NEI Corporation offers a service called TIPs™ – Transition Innovations to Products, which adds value to technologies that are at a nascent stage, making it more attractive for either a licensing agreement or for further investment. The TIPs process is most effective when the technology needs to be scaled to a level that a potential licensee or a corporate commercialization partner begins to gain confidence in the technology. NEI's TIPs service is designed so that the institution's Intellectual Property remains free and clear and is not encumbered by partnering with NEI.

### Battery R&D Services

NEI offers cost-effective, comprehensive materials development, characterization, & electrochemical testing services to its customers. In recent years, multinational corporations, small businesses, U.S. national laboratories, researchers at universities, and U.S. federal laboratories have all benefited from utilizing NEI's services and products. Our ability to tailor materials has resulted in improved battery performance for our customers. We also have manufacturing capabilities in place to produce your custom material in large quantities, and all work is done in a highly confidential manner.

### Battery Materials Development

NEI offers customized battery materials development services to suit your application's specific needs. Our ability to tailor materials has resulted in improved battery performance for our customers. We create a custom materials solution to meet your requirements through a structured approach involving specified milestones.

### Battery Testing Services

NEI offers cost-effective and comprehensive electrochemical testing services, which include lithium-ion coin cell and pouch cell fabrication and testing. Our expertise in fundamental materials science and battery testing allows us to make correlations between materials characteristics and performance, assisting our customers in attaining the best cell performance with their materials.

### Electrospinning

NEI Corporation offers a service for producing nanoscale and microscale fibers through electrospinning. NEI is offering its knowledge and expertise in helping to transition concepts into working prototypes. Electrospinning is a technique to form fibers by the use of a voltage potential between a solution of the material and a grounded collector. The process elongates the fiber as it is formed, yielding fiber diameters typically in the range of 50 to 500 nm. The electrospinning equipment at NEI allows for large areas of fiber mats, upwards of one square foot. Combined with a variety of characterization and testing equipment already available in-house, this can accelerate development of the customer's technology into commercial materials.





## Technology Platforms

NEI provides advanced materials development services based on experience with several technologies.

### Self-Healing Polymers

NEI has developed a generic self-healing technology that allows polymer coatings to “self heal if scratched or cracked. To date, we have demonstrated self-healing in polyurethane-based coatings. We are implementing our technology in various polymer materials for specific commercial applications.

### Corrosion Protection

NEI has developed chromate-free anti-corrosion coating systems for aluminum, steel and magnesium. These environmentally friendly coatings include pretreatments, primers, and topcoats and are based on nanoscale materials. The coatings provide advantages in specific applications, such as reducing the need for grit blasting by using one of NEI's pretreatments.

### Hard, Scratch Resistant Barrier Coatings

NEI has developed transparent coatings for polymer substrates that offer exceptional hardness and scratch resistance. Our environmentally benign coating solutions are waterborne. The composition of the coating can be tailored to suit specific application requirements.

### Polymer Coatings for Fabrics

NEI's additives for fluoropolymer fabric coatings and silicone fabric coatings resist unwanted permeation of gas through fabric, protect base fabric from environmental degradation, and provide chemical and environmental stability.

### Self-Healing Fiber-Composites

NEI's self-healing fiber-composite technology is designed to prevent growth of delamination cracks and micro-cracks in fiber-epoxy based composites. Our technology can “self-repair defects with high healing efficiency and can be implemented in conventional fiber reinforced epoxy composites.

### Sorbents for Absorbing Mercury from Flue Gas

NEI has developed an environmentally friendly sorbent that removes mercury from coal-fired power plant flue gas. Our sorbent exhibits high mercury adsorption efficiency and has limited impact on fly ash compared to conventional sorbents.

### Wastewater Treatment Media

NEI has produced sorbents that are highly efficient in adsorbing mercury and selenium from wastewater. These sorbents can treat contaminated soil and groundwater and are being engineered for other water treatment processes.

### Sludge Treatment Additives

NEI has developed nanoscale additives that dewater sludge more efficiently than conventionally used cationic polymers. The technology is being applied to both municipal and industrial sludge. Additionally, certain nanoscale materials have demonstrated odor control.

### Fluoroelastomer Seals and High Performance O-Rings

NEI has developed nanomaterial-based fluoroelastomers that improve the performance of seals and o-rings used in electrical submersible pumps for geothermal applications and other downhole equipment used in oil and gas drilling.

### Superhydrophobic Surface Treatment

NEI's superhydrophobic surface treatment imparts superhydrophobicity to surfaces, particularly at above ambient temperatures. In one particular application, the hydrophobic surface treatment increases condenser efficiency by facilitating drop-wise condensation as opposed to film-wise condensation.

### Custom Materials Synthesis

NEI has core competencies in synthesizing nanoscale particles, depositing nanoscale coatings on particles, modifying the surface of particles, and dispersing nanoparticles in aqueous and non-aqueous liquids.

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