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mPhase Technologies, Inc.
Ticker Symbol: (OTC BB: XDSL)
Shares Outstanding: 1.2B
Market Cap: \$15M
Avg. Daily Vol. (3 month): 4.2M

52 Week Price Range: \$.0125 - \$.038
Price as of 6/10/10: \$.013



Investment Highlights

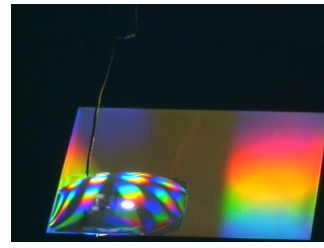
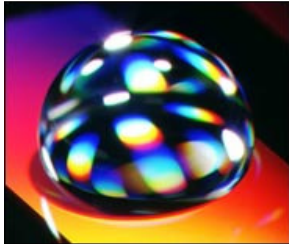
- mPhase is introducing a revolutionary Smart Surface technology enabled by breakthroughs in nanotechnology, MEMS processing and microfluidics.
- mPhase has a total of 15 patents filed protecting its intellectual property which includes 12 related to Smart Surfaces.
- Our Smart Surface technology has applications that include self-cleaning surfaces, water filtration, liquid and chemical sensors and controllable drug delivery.
- mPhase has pioneered its first Smart Surface enabled product, the *Smart NanoBattery*.
- mPhase has created a disruptive new approach to battery design for portable electronics.
- mPhase is building a better, more environmentally friendly battery, providing Power On Command™.
- The world battery market is \$70 billion today, driven by the broad expansion of portable devices and demand for lower-weight, longer-storage energy solutions.
- The U.S. government is investing heavily in battery sector innovation and recently allocated \$2.4 billion in stimulus funds.
- The company's flagship products have broad applications. Large markets include portable electronics, medical devices, computer memory and military aerospace.
- mPhase has been awarded U.S. government grants for the *Smart NanoBattery*, and is on track to deliver the world's first Smart Programmable Nanobattery to the U.S. Army.
- mPhase has introduced its first consumer product, the *mPower Emergency Illuminator*, designed by Porsche Design Studio and sold via the mPower website: www.mpowertech.com
- Additional consumer products are being developed under the mPower brand for the automotive and marine markets.

Company Description

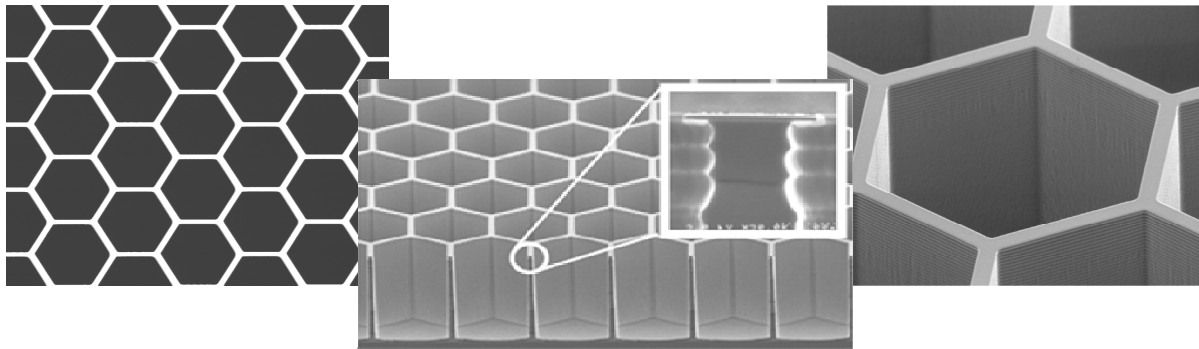
Introduction

mPhase Technologies, Inc., is an inventive and innovative development company specializing in the fabrication of Smart Surfaces enabled by recent breakthroughs in microfluidics, microelectromechanical systems (MEMS) and nanotechnology. A public company trading under the stock symbol OTC BB: XDSL, mPhase was founded in 1996 with offices in Little Falls, New Jersey; Norwalk, Connecticut; and New York City. The platform technology behind the **Smart NanoBattery** is a porous nanostructured membrane that repels and precisely controls the flow of certain liquids. mPhase is focused on commercializing its first Smart Surface enabled product for military and commercial applications: the **Smart NanoBattery** providing Power On Command™.

The photographs below show the precise control of a fluid on a mPhase man made nanostructured surface.



The photographs below show the underlying microscopic porous membrane which allows the control of a fluid.



Overhang Nanostructure

The membrane has a Smart Surface that can potentially be designed for numerous applications as described below:

Future Applications

- Self-Cleaning Surfaces
 - Windows, shower doors and boat hulls
 - Anti-fog mirrors, glasses and auto windows
 - Anti-bacterial surfaces for the food services and healthcare industries

- Water Purification

- Drinking water filters
- Removal of oil from water
- Environmental remediation
- Sensors
 - Liquid detectors
 - Chemical detectors
- Other Applications
 - Lab-on-a-chip
 - In vitro drug delivery
 - Liquid gas exchange

Battery Applications

In 2004, mPhase Technologies collaborated with the renowned Bell Laboratories to develop a new technology utilizing Smart Surfaces called the **Smart NanoBattery**. This **Smart NanoBattery** has the potential to revolutionize the battery industry. Features of the **Smart NanoBattery** include: near infinite shelf life, environmentally friendly design, fast ramp to power, programmable control, and direct integration with microelectronic devices. This well-patented technology is based on a phenomenon known as electrowetting that provides a unique way to activate the battery to gain access to energy stored and manage power.

mPhase's *Smart NanoBattery* technology has been incorporated in leading-edge research and development projects supported by various groups within the U.S. Army for mission-critical static random access memory (SRAM) backup and guided munitions applications.

mPhase received a Small Business Technology Transfer (STTR) Program Phase I grant for \$100,000 from the U.S. Army and in September 2008 was awarded a prestigious \$750,000 Phase II STTR grant to continue battery development work for the SRAM project. The company has also been working with the U.S. Army as part of a Cooperative Research and Development Agreement (CRADA).

mPhase has focused its efforts on the development of a lithium Smart NanoBattery. Working closely with other development companies and the Energy Storage Research Group at Rutgers University, mPhase has overcome every technical challenge to date and anxiously awaits the delivery of the world's first smart programmable reserve battery under its Phase II US Army STTR grant.

mPhase has introduced a mechanically activated reserve battery for consumer use and is beginning to brand reserve battery consumer products under the name mPower Technologies, Inc.



mPower Technologies is the wholly owned consumer products division of mPhase Technologies (XDSL.OB). mPower products utilize advanced battery technology developed by mPhase Technologies to provide battery powered products with a shelf life of at least 20 years.

mPower Technologies is quickly becoming the first company to commercialize consumer products featuring Power On Command™ reserve battery technology.

The first product on the market is the mPower Emergency Illuminator which is designed by the renowned Porsche Design Studio. It is a precision instrument with a powerful 180 Lumens

LED and two separate battery tubes. One tube is for everyday use and holds two CR123 batteries, while the other tube holds mPhase's Power On Command™ reserve battery. If the regular CR123 batteries run down, the Reserve Battery takes over—even after laying idle for 20 years. The Emergency Illuminator also features a USB port that can be used for charging portable devices such as a cell phone.

The mPower Emergency Illuminator has received several noteworthy media mentions in recent months, including positive reviews in publications as diverse as *The Wall Street Journal*, *GQ* and *Popular Mechanics*.

Two versions of the Illuminator are currently available for sale on the mPower website (<http://www.mpowertech.com>), one with a Black Satin finish and one with a Titanium finish. Further versions will become available for sale in the future. Additionally, the website offers for sale a glove box bracket for the Illuminator, as well as the mPower On Command™ Reserve Battery, which serves as the Illuminator's backup power source.

In addition to the online store, the website includes an interactive display that provides 360° horizontal and vertical views of the Illuminator as well as brief animations that highlight its various components. A second video offers a look at the mPower On Command™ Reserve Battery in action. Also featured on the website are background information on mPower Technologies; informative product data on the mPower Emergency Illuminator and mPower On Command™ Reserve Battery; and a detailed look at the technology that went into the Illuminator's design and manufacture. Customers can also download a warranty card and instruction manual. The website is available in English, French and German.

Additional consumer products are being developed under the mPower brand for the tactical, automotive and marine markets.

Platform Technology

Controlling Surface Properties

The surface is an important part of virtually every physical object and often plays an overriding role in many processes, beyond just connectivity and structural support, but more deeply into areas involving chemical and biological interactions. In some instances, the surface provides an easy entry into the chemical or biological systems; in others it protects the internal elements of the object, surrounded by the surfaces.

Microscopic Changes, World-Changing Innovation

mPhase's platform technology is the *Smart Surface*. By being able to control the surface properties of materials down to the nanometer scale, new and improved devices can be designed and built that may lead to compelling business opportunities. One type of smart surface of particular interest allows the properties to be changed in response to an external stimulus.

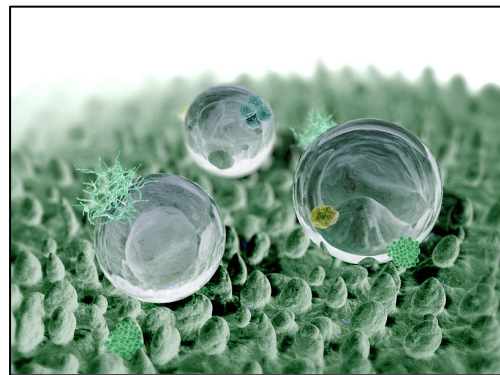
Initially, mPhase's development focused on MEMS devices by manipulating the surface of silicon materials—the same material used to make microelectronic materials and devices. Using physical and chemical processes, the surface of the silicon is modified to make solid porous structures known as membranes. This is where microfluidics comes into play. These membranes can be used to selectively control the flow of liquids through the pores or openings at the micrometer length scale.

Surfaces may be characterized as *hydrophilic* or *hydrophobic* depending on whether or not they attract or repel water (or other liquids). A hydrophilic surface can be wet and adsorbs water. A hydrophobic surface, on the other hand, cannot be wet. Hydrophilic and

hydrophobic surfaces are abundant in nature and in synthetic materials, both organic and inorganic in chemical composition. A familiar example of a hydrophilic surface is a sponge that readily soaks up water. By contrast, many plant leaves and flower petals are hydrophobic, as are insect parts and bird feathers. Synthetic hydrophobic surfaces include Scotchgard™ treated fabric, Teflon® coated metal, or Rain-X® coated glass. On a hydrophobic surface, water beads up and can move around without being absorbed by the solid material that it is resting on.

Engineering Inspired by Nature

But there is more. So-called *superhydrophobic* surfaces are also found in nature and can now be replicated in the lab. The lotus leaf and rose petal, for example, exhibit superhydrophobicity. Here water droplets form almost perfect spheres with hardly any contact with the underlying solid surface. This makes the liquid even easier to move and manipulate.



The synthesis of superhydrophobic surfaces has recently been made possible by advances in nanotechnology, and mPhase is leading the way to better understand and create materials and devices incorporating these unique surface properties.

Enormous Application Possibilities

As mPhase's research and development efforts evolve, in addition to silicon materials, the ability to control the surface properties of materials can be extended to other substances such as polymers, ceramics, metals and fibers as examples, providing opportunities for our platform technology to be used in a range of potential applications such as energy storage and power management for portable electronics and microelectronics, self-cleaning surfaces, filters for water purification or for materials, for environmental remediation that separate liquids or solvents, and other situations where the control of the interaction of a solid surface exposed to a liquid is vitally important.

Smart NanoBattery

Building a Better Battery

Battery technology has changed little in its fundamentals over the past 150 years. As a result, ordinary batteries begin dissipating energy as soon as they are assembled and therefore have limited shelf life. Chemistries are fixed inside the package so the user cannot interact with the contents to program functionality. The size and form of batteries have not kept pace with the miniaturization of electrical components, microprocessors and integrated circuits. As a result, the optimal implementation of an electronic device is not always achieved. Some batteries contain chemicals that are not considered safe or environmentally friendly ("green"). This makes disposal a potential issue.

mPhase is challenging this convention by using their proprietary superhydrophobic porous silicon membrane technology as the basis to build the Smart NanoBattery providing Power On Command™.

Near Infinite Shelf Life & Improved Power Management

Superhydrophobicity initially keeps the liquid electrolyte physically separated from the solid electrodes of the battery, thus preventing the chemical reactions from occurring that cause the battery to provide power. This gives the Smart NanoBattery the benefit of near infinite shelf life.

A conventional battery loses some capacity while sitting on the shelf in its package or stored in an electronic or electrical device, even before being used for the first time. On the other hand, the Smart NanoBattery is built so that it is inactive and remains that way indefinitely until it is turned on. No power is lost to self-discharge or leakage current prior to activation. When needed, the Smart NanoBattery can be activated on command via the phenomenon of electrowetting. The surface properties of the porous silicon membrane are selectively controlled to shift instantly from a superhydrophobic to hydrophilic state. In other words, electrowetting acts as the triggering mechanism.

mPhase has successfully fabricated and demonstrated its first 3-volt lithium-based Smart NanoBattery, based on a design allowing either manual or remote activation by the user, a feature known as Power on Command™.

By incorporating the phenomenon of electrowetting on nanostructured surfaces into a revolutionary way of storing energy, the Smart NanoBattery provides power to portable electronic and microelectronic devices exactly when and where it is needed. It is an alternative and an augmentation to conventional batteries, still converting stored chemical energy into usable electrical energy, but in a way that is potentially more reliable, more versatile, more environmentally friendly, and less expensive than the industry norm.

Products

Delivering Guaranteed Power on Command

mPhase is exploring military and commercial applications of smart surfaces in which the properties can be accurately and precisely controlled down to the nanometer scale. Electrowetting allows the switching from a hydrophobic to hydrophilic state as a result of an electronic stimulus.

The Smart NanoBattery, mPhase's first smart surface product, has a unique architecture that enables a shelf life of decades, remote activation, programmable control, scalable manufacturing, and adaptability to multiple configurations. The value proposition to the end user is to have a source of energy or power that is literally always ready—reliable, convenient, low-cost—a battery guaranteed to work at full capacity when and where you need it.

Putting It To Good Use

The Smart NanoBattery can conceivably supply power “*on command*” to a wide variety of portable electronic and microelectronic devices used in military, medical, industrial, and consumer applications.

mPhase has already proven that the battery works in lab tests as well as in a significant field test conducted for the U.S. Army as part of a smart munitions project. The relationship with the Army also includes a \$750,000 funded project to develop a battery for a mission critical

computer memory backup application. The target is a small footprint, 3-volt lithium battery with a minimum shelf life of 20 years and uninterruptible power output during this time period. No other battery technology available today can deliver the long-term performance requirements specified by the U.S. Army for this application.

Emergency Power You Can Depend On

The Smart NanoBattery can potentially be designed to accommodate a variety of sophisticated portable electronic and microelectronic devices including next-generation cell phones and PDAs, handheld gaming devices, wireless sensor systems, RFID tags, high-tech flashlights and beacons, health alert alarms, and non-implantable and implantable medical devices such as pacemakers.

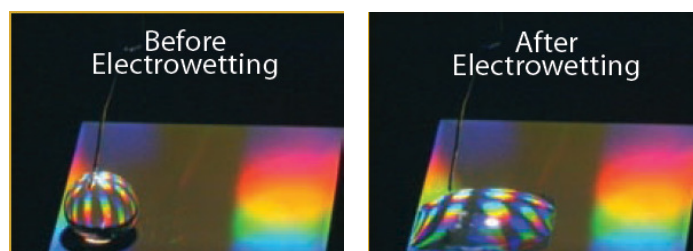
Initial applications will address the need to supply emergency and backup power to a range of products for defense and security, with future applications in the commercial and consumer arenas.

The photo below depicts mPhase's first *Smart NanoBattery* product.



Definitions

Electrowetting - The physical phenomenon by which a voltage is used to change the wetting properties of a liquid/solid interface. An example of such increased wettability is depicted in the photographs below. The left hand side shows a water droplet on a hydrophobic (water-repelling) surface. The water droplet does not like to be in contact with the surface and therefore minimizes the contact area. In the photograph on the right hand side, a voltage difference is applied between the electrode in the water and a sub-surface electrode present underneath the hydrophobic insulator material. As a result of the application of voltage, the droplet spreads, i.e. the wettability of the surface increases strongly. When the voltage is removed, the droplet returns to the original state indicated on the left hand side.



In the battery application, mPhase uses electrowetting as a new technique to activate a battery once it is ready to be used for the first time in an application.

Microelectromechanical Systems (MEMS) - The integration of mechanical elements, sensors, actuators, and electronics on a common silicon substrate through microfabrication technology.

The ability to precisely control the machining of the silicon-based materials led to mPhase's proprietary membrane design capable of controlling the flow of liquids.

Microfluidics - The behavior, precise control and manipulation of fluids that are geometrically constrained to a small, typically sub-millimeter, scale.

Microfluidics controls the flow of liquid electrolyte through the porous membrane in mPhase's Smart NanoBattery and is the basis for other applications such as filtration and separation. In the battery, the liquid electrolyte is initially separated from the solid electrodes, but microfluidics enables the electrolyte to move through the pores of the membrane to contact the electrodes when the battery is activated.

Nanotechnology - The creation of functional materials, devices and systems through control of matter (atoms and molecules) on the nanometer length scale (1-100 nanometers), and exploitation of novel phenomena and properties (physical, chemical, biological, mechanical, electrical) at that length scale. For comparison, 10 nanometers is 1000 times smaller than the diameter of a human hair. A scientific and technical revolution is underway based upon the ability to systematically organize and manipulate matter at the nanoscale and to engineer (design and manufacture) products enabled by nanotechnology.

The ability to create nanoscale features on the surface of porous silicon membranes resulted in mPhase's platform technology for new microfluidic applications.