



Press Kit

T (510) 841-7242 F (510) 841-4313 info@polyplus.com 2424 Sixth St. Berkeley, CA. 94710

Introduction:

The global race is on to develop a new chemistry that outperforms the Li-ion based batteries that are the current workhorse of mobile devices. Li-ion batteries were first invented in the 1970s and 80s, and were commercialized in 1990 by Sony. After decades of incremental improvements, Li-ion battery technology has matured and cell performance is approaching a plateau. The limited performance of Li-ion technology will become a major impediment for advances in the consumer electronics industry, the electric vehicle industry, for military hardware, and for clean energy applications.

PolyPlus Battery Company develops lightweight batteries based on lithium metal anodes. In the early 2000s, PolyPlus invented and patented the protected lithium electrode (PLE), a core technology that enables the use of ultra-light metallic lithium anodes in batteries. PolyPlus has used the PLE concept to develop both primary and rechargeable batteries with lithium metal anodes. PolyPlus' inventions include non-aqueous Li/sulfur batteries, primary Li-Seawater, primary and rechargeable Li-Air, and rechargeable aqueous Li-Sulfur batteries.

PolyPlus has further developed its battery prototypes, and is currently pushing toward manufacturing. The recent progress for our Li-Air and Li-Seawater batteries is highlighted here. If you have any questions, please email us at info@polyplus.com, or connect with our media contact:

Hannah Ray
hgray@polyplus.com
(510) 841-7242
2424 Sixth Street
Berkeley CA 94710



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Company overview:

PolyPlus Battery Company is headquartered in Berkeley, CA, and has been in continuous operation since 1991. PolyPlus is a world leader in the development of next-generation battery technology. The Company invented and patented the protected lithium electrode (PLE) which is a core technology for lithium-sulfur, lithium-air, and lithium water batteries. PolyPlus has a world-class team of scientists and engineers and a rich pool of intellectual property totaling more than 135 issued and 40 pending patents. The PLE was recognized by TIME magazine as one of the 50 Best Inventions of 2011, and by the Edison Committee with a Gold Edison Award in 2012.

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Biographies:

Steven J. Visco, Ph.D.

CEO & CTO, Director & Founder: Steve Visco is an internationally recognized expert in lithium batteries and fuel cells. Dr. Visco currently holds over 100 U.S. patents, more than 200 international patents and has authored close to 100 journal articles, as well as books, monographs and other publications. He has successfully raised \$45M in government contracts and grant awards, serves on numerous scientific committees and panel, and directed research leading to recognition of PolyPlus by TIME magazine and a Gold Edison Award in 2012. He received a B.S. in Chemistry from the University of Massachusetts, Amherst, a Ph.D in Chemistry from Brown University, and was a Postdoctoral Fellow at the University of California in Santa Barbara before joining the staff at the Lawrence Berkeley National Laboratory. In 2013 Dr. Visco was selected by the City of Berkeley for a "Visionary Award" for his work in next generation batteries. Steve also serves on the Technical Advisory Boards for the Conrad Foundation and the CIC Energigune Institute in Miñano, Spain and was awarded the 2011 International Battery Association Award for "Outstanding Contributions to the Development of Lithium-Air and Lithium-Water Batteries." In May 2015 Dr. Visco was elected a Fellow of the Electrochemical Society.

May-Ying Chu, Ph.D.

CFO, COO, Director & Founder: Dr. Chu has more than 20 years of experience in managing battery R&D, intellectual property portfolios, government contracts and audits, and is an inventor on 28 issued U.S. patents and more than 50 international patents. Chu is the lead inventor of the nonaqueous Li/sulfur battery technology. She received a B.S. and M.S. in Materials Science, both from the Massachusetts Institute of Technology, and a Ph.D in Materials Science from the University of California at Berkeley.



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Eugene S. Nimon, Ph.D.

Director of Research & Development: Dr. Nimon has extensive experience in the research and development of electrochemical systems and lithium batteries. He has authored over 70 scientific publications and is an inventor on 54 issued U.S. patents and close to 60 international patents. Dr. Nimon manages the PolyPlus R&D group. He was instrumental in the development and engineering of the protected lithium electrode, as well as PolyPlus breakthrough battery technologies including lithium-air, lithium-water, and lithium-sulfur. He received a Ph.D in Chemistry from the Frumkin Institute of Electrochemistry, Moscow, and an M.S. in Physics from Saratov State University, Russia.

Professor Lutgard C. De Jonghe

Chairman of the Board, Director, & Founder: Professor De Jonghe is a Professor in the Graduate School - Materials Science Department at U.C. Berkeley, has been a Senior Faculty Scientist at the Lawrence Berkeley National Laboratory since 1978, is an American Ceramic Society Fellow, and is an internationally recognized expert in ceramics and ionic devices. Prof. De Jonghe has more than 220 publications and holds 62 U.S. Patents. He was a Research Fellow in the Division of Engineering and Applied Physics at Harvard University, an Associate Professor at Cornell University, and a Senior U.S. Scientist and Humboldt Fellow at the Max-Planck-Institute in Germany, and has worked at the Nuclear Research Center in Belgium. He received a B.S. in Chemical Engineering from the Higher Technical Institute in Antwerp, Belgium, an M.S. in Metallurgy from the University of Delaware, and a Ph.D in Materials Science from the University of California at Berkeley.



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FAQs:

1. Are the batteries for sale? How much are they?

All three of PolyPlus' batteries are pre-commercial. Our initial products will focus on high margin applications where weight is a premium. PolyPlus will work with a partner and/or license the technology for high volume, cost-sensitive markets.

2. Are the Li-Air batteries appropriate for airplane power? EVs? Laptops?

Different battery applications have different requirements for duty cycle, load, capacity, rate capability, lifetime, cycle life, pulse performance, temperature, etc. To know if our battery types would be appropriate for a given application, contact us at info@polyplus.com with a description of the application and the above performance characteristics, and we will get back to you!

Below is a table that describes the ideal applications for our three battery types.



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Battery Type	Characteristics	Applications
Li-Seawater	Ultra lightweight and compact Water-activated Pressure tolerant Safe, non-toxic Lightweight Very Long duration Non-rechargeable	Offshore oil and gas exploration Oceanographic research Underwater sensors Underwater charging stations Underwater drones
Li-Air	Ultra lightweight and compact Air-activated Lightweight Long duration Non-rechargeable	US Army Soldier power Drones Remote sensors
Li-Sulfur	Rechargeable Ultra Lightweight Zero self-discharge	Consumer electronics Drones Stationary energy storage Electric vehicle energy pack



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News coverage:

2015 – R&D Magazine

2014 – Revolution-Green – PolyPlus Li-Air and Li-H₂O Batteries

<http://revolution-green.com/liair-li-h2o-batteries/>

2013 – Hybrid Cars – More Hope than Hype: PolyPlus pushes toward Lithium-Sulfur

<http://www.hybridcars.com/more-hope-than-hype-polyplus-pushes-toward-lithium-sulfur-batteries/>

2012 – MIT Technology Review – Beyond Lithium-Ion: ARPA-E Places Bets on Novel Energy Storage

<http://www.technologyreview.com/view/508071/beyond-lithium-ion-arpa-e-places-bets-on-novel-energy-storage/>

2012 – Journal Sentinal – PolyPlus, Johnson Controls team up on advanced lithium battery R&D

<http://www.jsonline.com/blogs/business/158599715.html#!page=1&pageSize=10&sort=newestfirst>

2012 – Bloomberg Business – Can PolyPlus' Batteries Power the Future?

<http://www.bloomberg.com/bw/articles/2012-04-05/can-polypluss-batteries-power-the-future>

2011 – Scientific American – How National Security Depends on Better Batteries

<http://www.scientificamerican.com/article/how-national-security-depends-on-better-batteries/>



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Press Releases:

FOR IMMEDIATE RELEASE

MEDIA CONTACT

Hannah Ray
PolyPlus Battery Company
hray@polyplus.com

POLYPLUS LITHIUM-AIR BATTERY PACK DELIVERS OVER 500 Wh/kg

Performance verified by U.S. Army CERDEC

DECEMBER 10, 2014 (Berkeley, CA) - PolyPlus Battery Company has constructed primary lithium-air battery packs that deliver over 500 Wh/kg. The record-breaking performance of this 4-cell, 40 Ah, 120 Wh Li-Air battery pack was verified by scientists at the U.S. Army CERDEC at the Aberdeen Proving Ground (APG) in Maryland.

These Li-Air battery packs are intended to serve as man-portable power for soldiers who need to operate critical electronic devices in the field. U.S. soldiers currently carry 20 pounds of batteries per 72 hour mission.¹ The introduction of ultra-light lithium-air batteries would significantly improve troop mobility, lengthen mission time, reduce re-supply quantities, and increase battlefield efficiency. PolyPlus is currently focused on increasing the rate capability of aqueous Li-Air batteries in order to satisfy all army needs in the field.

¹ <http://www.gizmag.com/universal-battery-charger-us-army/27665/>

Under a previous contract with CERDEC, PolyPlus developed Li-Air batteries that delivered 800 Wh/kg in independent tests at the U.S. Army CERDEC laboratories at APG. Army scientists claimed that this was the highest specific energy they've ever seen for an electrochemical device. Incorporation of these lightweight batteries into a pack, and confirmation of their performance, represents a large step in technical risk reduction.

"This is a major step in the development of the aqueous lithium-air technology," said Steve Visco, CEO and CTO. "The successful demonstration of Li-air cells in battery packs shows that they can provide a real service to the U.S. military and anyone else with a critical need for lightweight, portable energy."

The Li-Air batteries were built with PolyPlus' semi-automated pilot line located in Berkeley, CA. Optimization of the pilot manufacturing process was funded by a grant provided by the Department of Energy's Advanced Manufacturing Office.

ABOUT POLYPLUS BATTERY COMPANY

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DEVELOPING LITHIUM-SEAWATER BATTERIES FOR DEEP-DRIFTING SONOBUOYS

PolyPlus receives Phase II SBIR from Office of Naval Research

SEPTEMBER 1, 2015 (Berkeley, CA) - PolyPlus Battery Company has been granted a Phase II SBIR from the Office of Naval Research, aimed at testing the performance of PolyPlus' Li-Seawater battery cells for deep-drifting sonobuoy applications.

The sonobuoys would act as deep ocean listening devices to support the U.S. Navy's Anti-Submarine Warfare effort. PolyPlus' Lithium-Seawater batteries are uniquely suited to the sonobuoy application due to their safety, high energy density, and their tolerance of the high pressures encountered at large ocean depths. The Phase II funding will support initial testing of the battery performance. If the preliminary tests are successful, additional funding will support the build of a representative battery pack for the deep-drifting sonobuoy.

"PolyPlus Lithium-Seawater batteries are pretty remarkable, they have demonstrated the highest energy densities ever measured for a battery, and yet are also very safe," said Steve Visco, CEO and CTO of PolyPlus. "The Phase II

SBIR funding will give us the chance to tailor the product to the specific needs of the Navy customer's application."

The Li-Seawater batteries will be built with PolyPlus' semi-automated pilot line located in Berkeley, CA. Optimization of the pilot manufacturing process was funded by a grant provided by the Department of Energy's Advanced Manufacturing Office.

ABOUT POLYPLUS BATTERY COMPANY

PolyPlus Battery Company is headquartered in Berkeley, CA, and has been in continuous operation since 1991. PolyPlus is among the world leaders in the development of next-generation battery technology. The Company invented and patented the protected lithium electrode (PLE) which is a core technology for lithium-sulfur, lithium-air, and lithium water batteries. PolyPlus has built a world-class team of scientists and engineers and developed a rich pool of intellectual property totaling more than 135 issued and 40 pending patents. The PLE was recognized by TIME magazine as one of the 50 Best Inventions of 2011, and by the Edison Committee with a Gold Edison Award in 2012.

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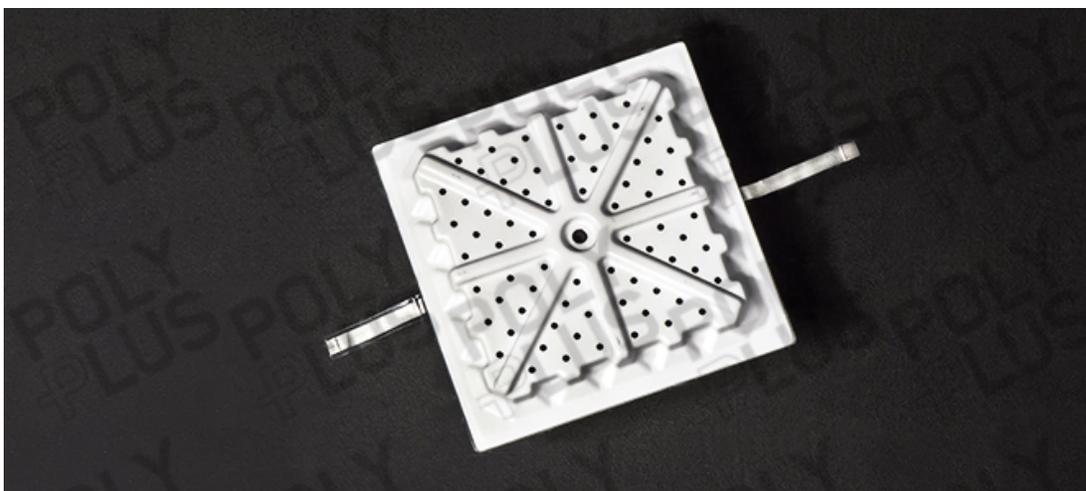
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Art:

Below: The PolyPlus Protected Lithium Electrode (PLE)



Below: The PolyPlus Lithium-Air Battery





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Below: The PolyPlus Lithium-Water Battery

