

D **eveloping Novel Organic Electronics**

ORFID Corporation is an organic electronics company with a unique technology that will enable the manufacture of new products such as light-weight and flexible displays, smart labels and intelligent packaging. Electronic products made with organic components will be dramatically less costly to manufacture and more versatile than today's silicon-based products.

ORFID is developing a new organic transistor, the **Vertical Organic Field Effect Transistor (VOFET)**, to replace the conventional silicon semiconductor transistor technology currently used to manufacture products such as flat panel displays and radio frequency identification tags (RFIDs). The Company's initial focus is to enable the development of fully organic displays that are thin, flexible, and inexpensive to manufacture. ORFID will do this by using its proprietary VOFET technology.

Conventional silicon-based transistor technology can be used in a limited way to manufacture organic light-emitting diode (OLED) displays. Due to technical constraints, OLED displays made with silicon transistors are rigid, thick, expensive to manufacture and are limited to smaller sizes. ORFID's approach to OLED displays will allow the displays to be thin and light weight, flexible, less capital intensive to manufacture, and amenable to use in larger sizes. This latter feature will lead to

new applications not possible using silicon-based technology, for example, electronic posters, and billboards.

The less capital-intensive, and, therefore, less costly processing of organic electronics is due partly to the printable nature of organic electronics in manufacturing. The printing techniques encompass technologies developed in the areas of inkjet printing, silk screening, gravure, and other long-standing printing methods. In addition, since the manufacture of organic electronics does not require expensive clean rooms, capital costs for producing organic electronics are lower than for silicon-based electronics.

Conventional organic transistor technologies are woefully inadequate for use in the manufacture of OLED displays. Other organic transistors do not have the current-carrying capacity required to power OLEDs. With its unique device architecture, ORFID's VOFET is a potentially disruptive technology that can provide 1,000 times the current of competing organic transistors at significantly lower operating voltages. In addition, the VOFET's unique architecture lends itself to simpler manufacture. The VOFET's superior current-carrying capacity and its novel architecture give ORFID a distinct technical advantage for exploiting organic transistors to manufacture OLED displays.

Market

Organic electronics, such as OLEDs, have already entered the \$45 billion flat panel display

market. OLEDs offer the advantages not only of lower cost, but also of performance. OLEDs are more energy-efficient and last longer than incandescent light bulbs, can be assembled on plastic substrates, and have none of the viewing angle problems of liquid crystal displays (LCDs). Today, as many as 50 companies have OLED R&D programs. Market research firm DisplaySearch predicts that OLED displays will capture \$1.6 billion of the overall display market by 2007, up from just \$84 million today. ORFID believes that its VOFET technology offers the potential to drive growth of the OLED display market.

In addition to the display opportunity, there is also great potential for organic electronics in relatively simple logic applications, such as RFID tags, smart labels, and intelligent packaging. The current combined market for these applications is approximately \$2 billion and is forecasted to grow to \$17 billion by 2010, according to the market research firm IDTechEx. Major companies and organizations such as Wal-Mart and the U.S. Department of Defense (DOD) have given a significant boost to organic electronics in simple logic applications by mandating that Wal-Mart and DOD vendors become "RFID compliant". Innovation in the design, development and manufacturing of

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organic electronic components and devices will enable RFID tags, intelligent packaging and low-cost electronic labels.

With its substantial intellectual property portfolio in organic RFID, and its VOFET technology, ORFID's long-term goal is to enable the introduction of fully printable organic RFID tags, smart labels and intelligent packaging.

Product and Partnering Strategy

Initially, ORFID is targeting the market for small-sized displays used in products such as cell phones—a \$4.3 billion opportunity. ORFID plans to produce products for and sell directly into this and other markets where display sizes are small and display performance requirements are less demanding. ORFID currently plans to co-develop and out-license technology for use in large-array displays (e.g., TVs, billboards), where device performance and manufacturing requirements are more demanding. ORFID will also license-out its technology for what it considers to be “non-core” applications.

The Company is actively engaged in discussions with a number of potential corporate partners, including major display manufacturers, materials and chemicals companies, printing companies, and consumer electronics companies worldwide. ORFID seeks partnerships not only to accelerate development of its technology and products, but also to acquire additional technology and manufacturing, marketing and distribution resources.

Company History and Funding

ORFID was founded in 2003 as a combined corporate and academic spin-out by Convergent Ventures (a Los Angeles-based venture capital firm), Precision Dynamics Corporation (a Los Angeles-based, privately held manufacturer of RFID devices for personal identification and

crowd control), and Dr. Yang Yang, a leading expert in organic electronics and Professor of Engineering and Materials Science at the University of California, Los Angeles.

ORFID received seed capital from Convergent Ventures and Precision Dynamics, both of which also contributed start-up management. ORFID raised additional capital in a Series A-1 financing round that included Precision Dynamics, Convergent Ventures and new investors.

ORFID plans to raise additional equity funding from both venture capital and corporate investors.

Management Team

ORFID's executive management team includes managers drawn from Convergent Ventures and from the semiconductor, materials and electronics industries. Executives include:

JONATHAN G. LASCH, PH.D.
Chairman and CEO

WILLIAM L. ROBBINS
Executive Vice President

DAVID MARGOLESE, PH.D.
Vice President, Technology Development

NIMA SHIVA
Vice President, Business Development

WINN HONG, M.S.E.
Sr. Director, Business Development

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Chairman & Chief Technology Officer, Precision Dynamics Corporation

RICHARD PAYNE, PH.D.
Vice President of Engineering, Polychromix Chemistry, UCLA

YANG YANG, PH.D.

Headquarters and Operations

ORFID's business offices are currently co-located at Convergent Ventures. The Company is conducting R&D in the lab of Dr. Yang at UCLA, under the auspices of a University of California Discovery Grant. ORFID plans to lease its own office and lab space on the Westside of Los Angeles.

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