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Focusing On The Lens Inside Phones

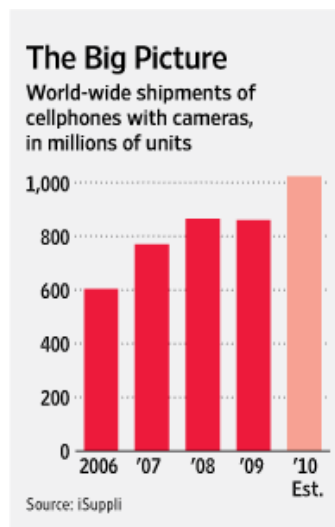
Don Clark

A Silicon Valley start-up is trying to shake up the market for camera phones with an unusual technology that can change the focus of a lens using no moving parts.

The closely held company, LensVector Inc., says it has developed tiny transparent components for autofocus systems that replace larger mechanical parts. With sturdier and less-expensive components, autofocus could change from an option found only on certain handsets into a standard feature of mainstream phones, the company said.

LensVector is taking a novel approach to manufacturing. Rather than turn to China or other countries with low labor costs, the company believes semiconductor-style production techniques will allow it to churn out components at competitive prices from its headquarters in Mountain View, Calif., said Derek Proudian, LensVector's chief executive.

There is no shortage of companies working on cellphone cameras, in part because it is a big market. In 2009, research firm iSuppli estimates, 76% of the 1.13 billion cellphones shipped came with at least one built-in camera.



Cellphone makers have been improving camera resolution with image-sensor chips that can handle millions of pixels. But without a way to shift focus, the devices still don't handle some chores well—particularly photos of faces or other objects at short distances.

Adjusting the Lens

Autofocus came with only 16% of handsets sold last year, iSuppli says. The technology, which is widely used on point-and-shoot cameras, emulates how a photographer adjusts the lens on a conventional camera to focus on objects at different distances. It relies on algorithms that help gauge distances and send instructions to a module that moves lenses in and out.

LensVector set out to replace the mechanical components. Its chief technology officer—Tigran Galstian, a professor at Laval University in Quebec—found a practical way to exploit earlier theories about adapting technology from liquid-crystal TVs and computer displays, Mr. Proudian said.

The technology uses liquid crystals—packed between glass layers—that rearrange themselves in response to an electric charge, changing the refraction of light that passes through the component. The component sits next to a conventional lens, adjusting the focus in response to commands from image sensors in the camera. "It works like a pair of eyeglasses," Mr. Proudian said.

The company, founded in 2006, has raised \$53 million from venture capitalists and the investment arms of Samsung Electronics Co. and Eastman Kodak Co. It is expected to announce a \$30 million funding round Thursday, and discuss its plans publicly for the first time.

The demand for autofocus will likely swell as Google Inc. and others promote applications that take pictures of bar codes to find out information about items in stores and print publications, predicted Matt Buckley, a senior marketing manager at Aptina Imaging Corp., a maker of image-sensor chips familiar with LensVector's technology.

Autofocus isn't typically used with videocameras in cellphones, in part because the mechanical components generate noise that interfere with audio recording, Mr. Proudian said. But LensVector's technology is silent and works well with videocameras, he said, and could be used in computers and other devices beyond phones.

Another factor is an industry shift to reduce cost by fabricating camera components on silicon wafers, the way computer chips are made. LensVector's components are already produced that way, making them ideal for combining autofocus with wafer-scale production, Mr. Proudian said.

Competing Technologies

Others are working on related technologies. Tessera Technologies Inc. and DxO Labs, for example, have developed so-called "extended depth of field" technology that uses software to help image-sensor chips create better images at a variety of distances.

But Henry Nothhaft, Tessera's chief executive, said that technology isn't a substitute for autofocus, which his company continues "to look at very carefully."

LensVector isn't disclosing which component makers might buy its products, but Mr. Proudian predicts they will start reaching cellphones in the second half of this year.

"It's not official yet, but I think there's a good chance we will see it this year" in Samsung cellphones, said Brian Kang, managing director of Samsung's venture-capital arm.

Tetsuo Omori, a market researcher with Techno System Research Co., said LensVector's components have "much potential" if they are less expensive than mechanical equivalents. Market researchers put the current cost of components and labor to add autofocus at around \$3.50 to \$4 per phone.

Mr. Proudian predicts his products will start at about the same price as existing technologies and get more cost-competitive as the company boosts production. "Once we get to capacity, we should be half the cost," Mr. Proudian said.

LensVector expects to eventually be able to churn out 60 million components a year from production lines in Silicon Valley, turning to external manufacturing partners later if needed.

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