

# IC Optix Develops Printed Magnifier Technology

A new privately held company called IC Optix®, based in Philadelphia, has developed a novel printed thin film magnifier technology integrated into product labels and everyday items such as pens, as a convenient vision aid for consumers. The patented magnifier technology is also used in a new type of 'self-authenticating' label.

Many people over the age of 40 years old have trouble reading important small print information on labels for medicines, foods, use instructions and other products. The reasons for this are twofold. The first is the effects of aging eyes due to presbyopia, and the second is that label manufacturers are often balancing the need to include required information on the product label with a lack of sufficient real estate on which to print it.

Many products, and particularly drug products, are packaged in relatively small containers, which limits the size of label that can be used. Thus, in order to provide all the required information, the manufacturers are often left with no option but to use very small text, which is crowded and often difficult or impossible for most people to read without some form of vision aid. Medication errors can therefore occur – which is a public health concern.

Moreover, according to a report published by the Institute of Medicine (IOM) in 2006, titled 'Preventing Medication Errors', labelling and packaging issues were cited as the cause of 33% of all medication errors and 30% of fatalities from medication errors.

The IOM emphasised that 'product naming, labeling, and packaging should be designed for the end user – the provider in the clinical environment and/or the consumer.'

More specifically, the report urged the Food and Drug Administration (FDA) to address safety issues related to product labeling and nomenclature using the principles of cognitive and human factors engineering.

Guidance provided by the FDA in 2013 for prescription drugs recommends at least a 12 point font size wherever label size permits, but also encourages manufacturers to explore unique packaging approaches to address this issue.

## Unique technology tackles problem

In response, IC Optix has developed a low cost, highly scalable, unique magnifier label technology solution that tackles the problem of label legibility, thereby improving consumer/patient compliance and safety by reducing the chance of medical error.

The company confirms that the technology is also readily integrated into a manufacturer's standard packaging and labeling processes with a low impact on operations.

Current products developed by IC Optix include magnifier labels, which are similar to conventional multilayer labels with a surface layer that peels away to reveal additional information.

The peel layer in this instance is the functional magnifier lens. This is integrated as a component into the primary design of the product label for use as a magnifier to read the small print on the label.



Magnifier lens labels



Magnifier lens on a bottle

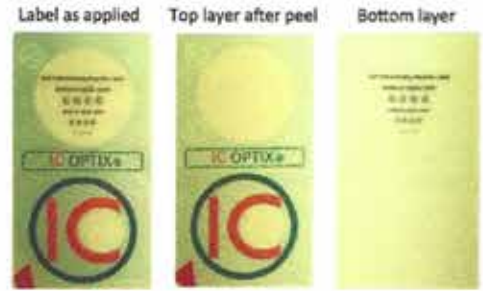
The magnifier lens layer is durable and can then be re-adhered to the label surface for re-use at a later date.

Then there are transparent magnifier labels, which provide an alternative to the integrated magnifier labels and are suitable when there exists a primary label that does not need a redesign of the label or graphics.

The transparent magnifier label is applied over the top of the primary label or onto printed cartons (an over-label). As in the magnifier label case, the surface layer of the transparent label can be peeled and used as a magnifier to view text and graphics on the packaging, before being re-adhered to the surface of the label or package for re-use at a later time.

## Authentication and tamper evidence

Customisable security layers can also be integrated into the labels, including overt and covert microstructures, diffractive microstructures, void features, and tamper evidence. A self-authentication magnifier feature can also be incorporated. For example, the label can include microtext that can then be read with the magnifier lens.



Self-authenticating magnifier label



Close-up of microtext on both the top and bottom layers

An example of a self-authenticating tamper evident label is shown above, where microtext on the bottom layer can be read using the lens on the top layer. Two different focal length lenses are integrated into the label providing 3x magnification (open circle at top of label) and 6x magnification (the smaller clear circle within the C at the bottom part of the label). Diffractive microstructures can be seen at locations around the outside of the lens area.

Another of IC Optix' products is a scrolling magnifier device.

Many functional everyday magnifiers are hot embossed into plastic materials which can be a few hundred microns thick. In this product, the ultra-thin and flexible durable properties of the magnifying lens enable the film to be scrolled onto and off a spindle in the same way as a roller blind, thereby providing a larger magnifier film area to be used.



Scrolling magnifier opened

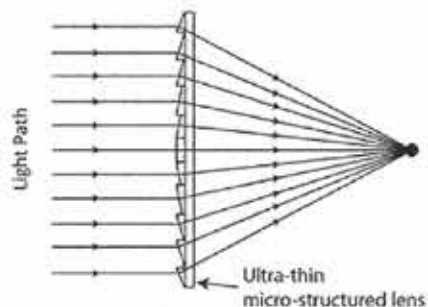


The film can be integrated into everyday portable objects such as pens, flashlights or key fobs, enabling the magnifier device to be close at hand.

### Lens design and manufacture

The design of an ultra-thin film magnifier lens begins with computer modeling of a microstructured lens, providing the desired optical lens prescription.

The lens design is then transferred from the digital world into the physical world using a high precision diamond engraving process.



A depiction of a thin film magnifying lens

A master tool with exact facet angles, depths, and spacing is created for the manufacture of a high quality optical lens.

To achieve high volume, low cost production of the lens, the master tool engraving is replicated and repeated across a cylinder. This produces the lens array using a reel to reel UV casting manufacturing process. The process is very flexible and allows for customisation of the lens size, shape, thickness, and optical prescription. Typical lens thickness is 50-75 microns, depending upon requirements of the final application.

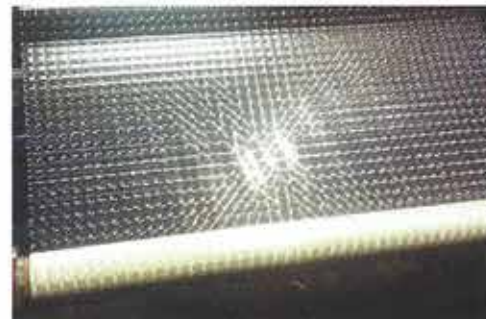


An engraved master tool

The lens array is slit, wound on reels, and subsequently further converted into finished magnifier labels and scrolling magnifier devices such as pens.

This new technology has many applications for authentication and self-authentication devices, to name but a few. We look forward to reporting in the future on the further developments of IC Optix products and its technology.

[www.ic-optix.com](http://www.ic-optix.com)



Lens array