HumanEyes

Lenticular Education Kit By HumanEyes

Print Out of the Box

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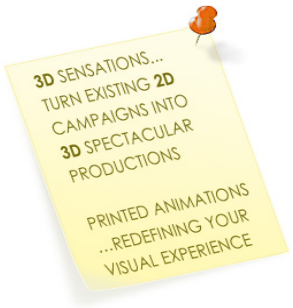
Why is lenticular such a powerful medium?



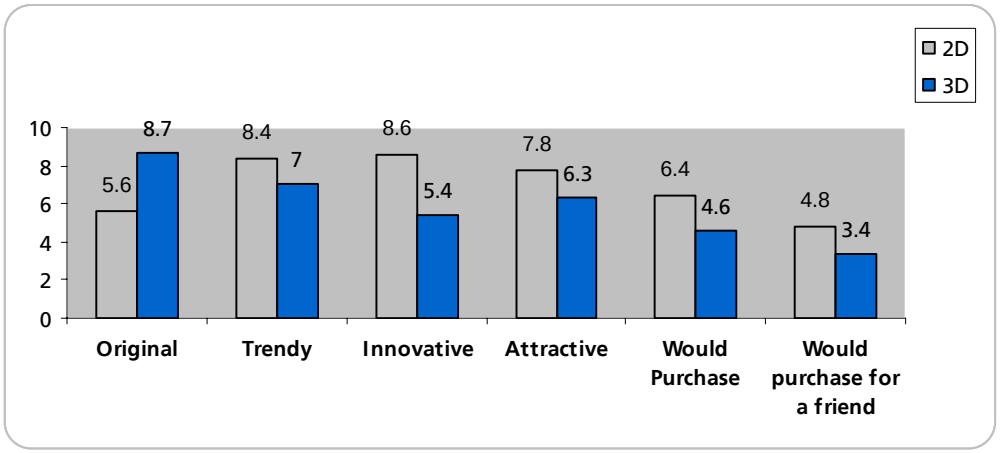
3D and lenticular are an amazing new medium for communicating your customers' branding and advertising messages.

Lenticular printing allows designers to expand their creative horizons with movement, depth and animation. These mediums of advertising have proven themselves as delivering significantly more impact for every dollar spent! Printers can offer their customers new innovative services that they will love paying for!

3D has incredible staying power, as a matter of fact a study reveled some amazing facts about advertising in 3D:

- In a side by side study, people preferred the advertisement in 3D **2.5 times more** then they did the 2D advertisement.
- In the same study**, 2 times more** people felt the advertisement looked better in 3D.
- Overall, people preferred 3D **3 times** more then 2D.
- In another study participants were presented a CD with a 3D cover and one without one. Participants were willing to pay **16% more** for the CD with a 3D cover.

In another study participants were presented with two notebooks, one with a cover in 3D and one without. The graph below shows how the 3D notebook was favored in all categories.



Lenticular effects

3D

Refers to a printed image that shows depth as the viewing angle changes. In 3D, the picture's elements are positioned in different levels in order that an illusion of depth and perspective could be assigned to each of them. Unlike 2-dimensional design, using this lenticular 3D effect adds reality to graphics.

Photographic 3D

A sequence of images is shot using any standard still or video digital camera, and then downloaded to the computer where the software generates the required views depending on the desired depth. Any single standard digital still or video camera can be used to capture the sequence. As always, the higher the camera quality is, the better the result will be.
The photographer should use an arm to connect the camera to a tripod. The photos are shot by moving the arm in an arc motion.
A professional photographer is needed only when a professional photographer would be used for 2D photo shoots.
This 3D capture procedure may be used for a large variety of themes such as pack shots, architecture, and people.

Layered 3D

When a regular 2D image is separated into different layers, depth may be separately assigned to each of the layers to create a depth illusion. This is a good method to add depth to a computer generated image that was originally created using layers, or a 2D photo that have been manually separated into different layers.

2D to 3D conversion

HumanEyes' latest technology enables to generate 3D images starting with any regular stock 2D photo/image. Using the HumanEyes 2D to 3D conversion method allows for an easy and fast process that does not involve highly time consuming tracing work. The HumanEyes 2D to 3D conversion module also provide users with easy to use tools to generate perspective and apply volume to flat images and elements. 2D to 3D conversion process maximizes the use of exiting image assets. Huge inventories of stock photography as well as customers' existing assets can serve as fresh sources for amazing 3D creations.

Photographic 3D is recommended when a new photographic session is feasible, whereas 2D to 3D conversion should be used when photographic 3D is not applicable.

Flip

A dramatic swapping of two or more images-each vanishing and then reappearing from one to another. Utilizing this lenticular flip effect is most beneficial for demonstrating "cause-and-effect" or even "before-and-after" comparisons. Flip is also a good way to deliver multiple messages within the same space.

Animations

Movement, zoom, rotation.
Using a series of images coming together to create an animation much like a short movie clip. The illusion of motion actually comes from either a selection of video frames or sequential still images. This lenticular animation effect is great for emphasizing body movement or mechanical action.

Lenticular applications

Digital Applications

POP

Posters, retail stand and displays, windows graphics, coupon dispensers, entry doors, floor graphics…

3D & lenticular technology offers a cost effective method of transforming traditional, in-store media into powerful, high impact marketing tools. 3D design may become the entire retail display or be incorporated into a display as part of it. For example, lenticular may be used to demonstrate a product in action using animations or other lenticular effects. Moreover, the new HumanEyes LensFree™ technology enables backlit 3D and 2D animation effects to be printed directly onto glass or acrylic (see page 11). LensFree™ 3D backlit poster can serve permanently or for a short term as in-store POP panel, as part of window graphics or as interior decoration.

Outdoor/out of home advertising

Bus shelters, telephone kiosks, movie theatre displays, railway and underground advertising airport displays…

Out of home is at the mercy of advertising clutter. Out-of-home communication must be highly visible and dynamic to capture target audiences and by passers' attention. That's why 3D and other lenticular effects are a promising way to break the current boundaries of creativity and thus replenish the stopping and staying power of outdoor advertisements. Lenticular advertisement cannot be ignored since HumanEyes' technology enhances the power of colors, size and images so that they're highly eye catching.

Vending machines and slot machines

Large photographic backlit lenticular or LensFree 3D panel is an attractive method to turn a common distributor machine into a compelling display, since the lenticular effect will come out behind the glass and will be highly eye catching .

Events

Environmental design, creative walls, floor graphics, trade show displays, exhibition graphic, entertainment decorations…

Consumers have clearly manifested their preference to learn about products through non-conventional marketing methods such as tradeshows, road-shows and seminars over traditional media. Using 3D lenticular technology, HumanEyes delivers an innovative solution to designers seeking unparalleled visual power for their event graphics. The result sets a complete, striking, and positive mood that encourages marketing message buy-in.

Offset (Litho Printing) Applications

Product Packaging

Lenticular effects integrated onto cereal boxes, CD covers, DVD covers, VHS cases, bottles, labels, book covers, magazines covers, food packaging, labels, toy packaging, children's books and luxury product packaging such as cosmetics, alcoholic beverages and fashion…

Packaging's function is no longer limited to containing and protecting the product. Packaging has become a primary tool for product vendors to prevail in the ''sales per square foot" war.
Attractive, stand- out packaging is a vendor's last opportunity to influence the decision making process at its final stage. This is where a decision to use a HumanEyes product can be a business- owner's most strategic decision.

Advertising products and premiums

Pins, key chains, magnets, mouse pads, travel tags, badges…

Promotional products are a rapidly growing segment that answers the need for today's preferred, one-to-one marketing strategies. A promotional product that involves lenticular effects is different in that it is more sophisticated and interesting. Offering an advertising product with a 3D lenticular design is more meaningful than any common gift: it offers a smart and unique way to reflect dedication to clients.

Plastic Cards

Gift cards, mobile calling cards, business cards, loyalty program cards, museum cards, membership cards, public transportation passes, collectors' and playing cards…

HumanEyes greatly enhances card appearance and consequently strengthens branding. In addition to fostering bold and unique creations, the nature of the lenticular substrate HumanEyes requires reinforces card quality and life expectancy. And, as lenticular is almost non reproducible by scanning methods, adding lenticular to a card also adds an additional security feature.

Entertainment cards

Greeting cards, postcards, e-cards, animated kids' cards, currency conversion cards, invitation cards…

People using interactive or printable cards look for unique, colorful, attractive designs; thus, entertainment cards must be highly creative to be chosen from the vast selections available.
3D properties bring movement and energy to what is otherwise a lifeless, static medium. Combined with other effects (such as music, animations, sound) and/or a personalized work, 3D offers the most novel, exciting results. The result is a highly differentiated brand that can fortify leadership and revive eroding profits.

Stationery products

Notebooks, coasters, kids' stickers, rulers, bracelets, collectible products, calendars, jigsaw puzzles…

There are many common products that circulate in the market and remain unnoticed because they just don't catch the eye. HumanEyes technology offers marketers the opportunity to create vivid, aesthetically-pleasing items of both a collectible and non-collectible nature.

Direct mail

Envelopes, flyers, shipping boxes, invites, postcards, magazine inserts, discount offers, samples…

To be effective, direct mail campaigns must overcome consumers' tendencies to dismiss and dispose of what they perceive to be "junk mail" – even before they know what's inside. Lenticular is provocative – it stirs the target's curiosity and encourages interaction with the piece. The opened and viewed mail therefore can effectively convey a message and meet the direct mail campaign's goal.

The Lenticular Substrate

Lenticular lenses

Lenticular lenses are plastic lenses consisting of an array of optical elements (lenticules). When viewed from different angles, different areas under the lens are magnified. Different thickness lenses are suitable for different applications and printing methods. In general, thick lenses are more suitable for printing large posters using a digital printer. Thin lenses are more suitable for small handheld pictures printed with offset printers.

Lenticular Type	Suitable Graphic Effects	Applications	Recommended Viewing Distance	Production possibilities
62 LPI (44 degrees)	Ideal for 3D	Small POP displays and signs, Direct mail, Greeting cards and Post Cards Sales promotion premiums Notebook covers Packaging,	0.3 – 1.5 (m) 1-5(f)	Lithographic offset, DI print presses
70 LPI	Ideal for 3D	Small POP displays and signs Direct mail, Greeting cards and Post Cards Sales promotion premiums, Notebook, book and magazine covers Packaging, Business cards Inserts		Lithographic offset, DI print presses HP Indigo press s2000
75 LPI (46 degrees)	Ideal for Flip, Animation, Morph, Zoom, Reasonable for 3D	Small POP displays and signs Direct mail, Greeting cards and Post Cards Sales promotion premiums, Notebook, book and magazine covers Packaging, Business cards, Inserts	0.2 – 1 (m) 0.65-3.3(f)	Lithographic offset, DI print presses
100 LPI (42 degrees)	Ideal for Flip, Animation, Morph, Zoom, Reasonable for 3D	Direct mail, Greeting cards and Post Cards Sales promotion premiums, Notebook, book and magazine covers Business cards, Inserts		Lithographic offset, DI print presses
100 LPI 3D (30 degrees)	Ideal for 3D	Small POP displays and signs Direct mail, Greeting cards and Post Cards Sales promotion premiums, Notebook, book and magazine covers Packaging, Business cards, Inserts		Lithographic offset, DI print presses

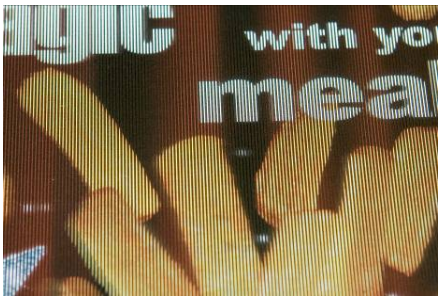
Lenticular Type	Suitable Graphic Effects	Applications	Recommended Viewing Distance	Production possibilities
10 LPI (48 Degrees)	Flip, Animation, Morph, Zoom	Billboards, Outdoor Signage, Wall Murals, Large Trade Show Graphics, Transportation/Bus Shelters	3-15 (m) 10-50 (f) or More	Wide Format Inkjet Plotters, Photographic printers, Flat Bed inkjet wide format UV presses
15 LPI (47 Degrees)	Ideal for Flip, Animation, Morph, Zoom, some 3D	POP Displays, Trade Show Graphics, General Purpose Signage, Transportation/Bus Shelters	1.5 – 6 (m) 5-20 (f)	Wide Format Inkjet Plotters, Photographic printers, Flat Bed inkjet wide format UV presses
20 LPI (47 Degrees)	Ideal for Flip, Animation, Morph, Zoom, some 3D	Retail POP Displays, Trade Show Graphics, Transportation/sBus Shelters	1.5 – 6 (m) 5-20 (f)	Wide Format Inkjet Plotters, Photographic printers, Flat Bed inkjet wide format UV presses
20 LPI-3D (29 degrees)	3D	Retail POP Displays, Trade Show Graphics, Outdoor Displays	1.5-6 (m) 5-20 (f)	Wide Format Inkjet Plotters, Photographic printers, Flat Bed inkjet wide format UV presses
30 LPI (49 degrees)	Flip, Animation, Morph, Zoom, some 3D	POP Displays, Trade Show Graphics, General Purpose Signage	0.9-4.5 (m) 3-15 (f)	Wide Format Inkjet Plotters, Photographic printers, Flat Bed inkjet wide format UV presses
40 LPI-3D (25 degrees)	Ideal for 3D, Reasonable for Flip and Animation (fast)	POP Displays, Trade Show Graphics, General Purpose Signage, Transportation/Bus Shelters	0.9-4.5 (m) 3-15 (f)	Wide Format Inkjet Plotters, Photographic printers, Flat Bed inkjet wide format UV presses
60 LPI-3D (26 Degrees)	Ideal for 3D	Small POP displays and signs	0.3-3 (m) 1–10 (f) or more	Wide Format Inkjet Plotters, Photographic printers, Flat Bed inkjet wide format UV presses

HumanEyes LensFree™ technology

Pursuing its way in encouraging growth of 3D and lenticular business, HumanEyes developed a new technology - the LensFree™ technology - now incorporated into HumanEyes Producer3D - for digital flatbed UV wide format printing. As the name suggests, this recent HumanEyes innovation is enabling backlit 3D and 2D animation effects to be printed directly onto glass or acrylic (plexiglas), helping reduce the barriers to lenticular printing such as high cost of lenticular.

LensFree Printing creates a lenticular barrier without the lenticular. LensFree printing will print the lenticules on the plastic at almost any spacing one desires (LPI).
Working with LensFree Printing is just like working with HumanEyes PrintPro. One can create one's lenticular project first and then print the lenticular barrier or alternatively one can create the lenticular barrier and then produce the lenticular project.

Digital printers utilizing a flatbed printer with UV capabilities can take advantage of what LensFree has to offer them. Now digital flatbed printers can expand their product offering, by completing backlit lenticular applications services. By the nature of the flatbed printer, not only will flatbed printers be able to create stunning applications at standard sizes – they will be able to offer lenticular applications that are large format of tile applications.



Lenticular Printing Basics

Introduction

▪ **Lenticular Lens**	A plastic lens consisting of an array of optical elements called lenticules. When viewed from different angles, different areas under the lens are magnified.
▪ **Lenticular Image**	A specially prepared image to which the lens is attached. Views are arranged under lenticules so that each eye is projected a different view. The brain then processes these views to a single coherent 3D image**.**

Lens Types

There are many different types of lenticular lenses. Different lens types are suitable for different applications. Two main parameters differentiate between the different lens types:

▪ **(Mechanical) Pitch**	The exact physical count of lenticules per inch. Pitch value is measured in Lenticules Per Inch (LPI).
▪ **Viewing angle**	• Lenses come in different viewing angles. The main distinction is between wide and narrow viewing angled lenses. • The thickness is determined by both the pitch and the viewing angle. The lower the pitch, the thicker the lens. The narrower the viewing angle the thicker the lens and the larger the viewing distance for 3D.

Selecting Lenses

The following aspects should be considered when selecting a lens:

▪ **Lens thickness**	· A distinction is usually made between thick lenses (up to 60 LPI) and thin lenses (60 LPI and above). The lens thickness varies between 150 mil (3.81 mm) to 48 mil (1.22 mm) for thick lenses and from 27 mil (0.686 mm) to 14 mil (0.355 mm) for thin lenses. · Different thickness lenses are suitable for different applications. In general, thick lenses are more suitable for printing wide format applications. Thin lenses are more suitable for small, handheld applications and ones with a short viewing distance.
▪ **The desired effect**	Narrow angle lenses are more suitable for 3D while wide angle lenses are better for flip and animation effects.
▪ **Printing resolution**	The ratio between the printing resolution and the pitch determines the number of views that can be placed under each lenticule. The higher the lens's pitch, the higher the printing resolution required for effective 3D viewing.
▪ **Viewing distance**	Thick lenses are suitable for medium to long viewing distances (airports, trade shows, malls, POS etc.) and thin lenses are suitable for shorter viewing distances (handheld items, magazine inserts and packaging, postcards and greeting cards, direct mailing, small posters and promotional items).

Preparing a Lenticular Image

▪ **Interlacing**	· The process of creating a lenticular image from a set of 2D images. Thin strips taken from each of the 2D images are interleaved into one image to match a specific lens pitch. · Interlacing the image according to the optical pitch ensures optimal viewing experience. Incorrect optical pitch can introduce blurriness and ineffective 3D viewing. In flip and animated effects an incorrect pitch would result in ghosting.

Printing Methods

▪ **Printing directly on lens**	There are two main pre-requisites to allow direct printing on the lenticular lens: the printing systems' ability to handle substrates as thick as the lenticular lens and the usage of ink technology that enables the ink to adhere to the plastic and to immediately set on it. The advantage of this method is that it saves the need for lamination (see below).
▪ **Printing on paper and laminating**	When the printing device is incapable of printing directly on the lens, there is also a possibility of printing on paper and then laminating the paper to the lens. This requires aligning the printed image with the lens, and maintaining the alignment while laminating.

More about Lenses

▪ **Durability**	The lenticular lens is manufactured from various types of plastic (PETG, PVC, Acrylic). The lens's ability to withstand extreme weather conditions as well as its resistance to vandalism, scratches, breakage and fire depends on the type of plastic from which it is made.
▪ **Maintenance**	As the lenses are made of plastic, they can shrink or expand if affected by changes in humidity or temperature. Therefore, to avoid a change in the pitch of a lens, lenses should be stored in a controlled environment.
▪ **Cost**	The thicker the lens is, the higher its cost will be. There is economic sense in that, as the thick lenses are used for large format, short run application with relatively high profit margins, which justify the high cost of the lens. Smaller jobs that are printed in masses are printed using litho on relatively low cost lenticulars.

HumanEyes' solutions

HumanEyes Technologies is the creator of amazing lenticular solutions that are designed to address the needs of the entire graphics art production chain, from photography through design and print output.

HumanEyes Capture3D – for photographers - enables to handle easily and quickly a 3D photography project.

HumanEyes Creative3D – for creative professionals - gives designers full control over the lenticular design process and easily converts 2D projects into 3D for easy reproduction.

HumanEyes Producer3D – for printers – includes 3 application modules: HumanEyes Capture3D, HumanEyes Creative3D, and HumanEyes Producer3D.

HumanEyes Producer3D is HumanEyes' end-to-end lenticular workflow solution, giving digital and offset printers everything they need for creation through production of 3D and lenticular projects.

What is the connection between HumanEyes Creative3D and Producer3D

Before HumanEyes Creative3D

From Designers perspective

Before HumanEyes Creative3D, major barriers prevented designers and brand owners from wanting to enter into lenticular projects:

- Only highly trained specialists with long experience in lenticular were able to undertake lenticular projects.
- Designers could not control the lenticular creative process
- Main stream designers had no lenticular knowledge and capabilities.

From Printers perspective

- Before HumanEyes Creative3D, printers encountered difficulties in generating demand for lenticular projects:
- Designers were reluctant to undertake lenticular projects because they didn't have any control over the process.
- Printers spent a lot of time on lenticular projects as they had to support the creative content creation process which they do not usually do anymore.

HumanEyes Creative3D

- makes lenticular more feasible and popular
- integrates more the creative professionals into lenticular projects

Thanks to HumanEyes Creative3D

- Designers can now, independently, create their own lenticular projects, have full control over the design, and pass on a ready to print job for easy production by the printer.
- HumanEyes Creative3D works hand in hand with HumanEyes Producer3D.

- HumanEyes Creative3D reduces printers' time and effort in respect to contents creation by placing this process with the right link in the supply chain: the designers
- Printers only have to do final adjustments and interlace files to print.
- HumanEyes Creative3D is a sales tool for printers: they can offer it to their customers in order to encourage them to do lenticular projects.