

The lenticular printing process allows us to achieve the illusion of animation or three-dimensional depth using a two dimensional medium.

This is accomplished by means of a lenticular lens that is positioned above a series of images. For animation, these images are sliced apart and interlaced or interleaved together in such a way that the viewer's eyes are focused only on the slices of one of the individual images at a time. In 3-D, each eye is focused on elements of two different images, thus sending two signals to the brain creating a parallax view.

As the lenticular lens, or screen as it is sometimes referred, is rotated, the curvature of the individual lenses that together form the screen, plays back the successive images recreating a scene, animation or three-dimensional picture.

Animated images may be created in a number of different formats including traditional reflective or computer art, computer generated animations, or video or cine film formats. Animated lenticulars are normally created using the lenticular screen in a horizontal format but may also be done vertically. However, when using vertical lenticules or side to side animation as it is referred, the chances of seeing portions of two different frames or phases is increased dramatically due to the parallax of the viewer.

Three-dimensional pictures must be created using special multi-lensed cameras; cameras fitted to specially designed moving tracks or from computer rendered 3-D images. Two dimensional or flat artwork may be sliced up and converted to give the impression of depth. Three-dimensional lenticulars are always constructed with the lenticules running vertically so that the parallax or distance between the eyes guarantees that each eye sees a different image.

3D backgrounds should be nondescript but feature some sort of texture or pattern. Plain colored backgrounds will diminish the amount of viewable depth. Items, which are showcased and have text, which must be clearly read, should be featured on the aim point or middle plane of depth (perceived as the surface of the lens). Similarly, objects that protrude into the background and above the surface of the lens will appear less in focus.

For the most effective flip images or animations, backgrounds should always remain constant. Localized flip or animated elements will feature the most convincing effects. For flip or animated images within a 3D environment, place active elements on the "key" plane only. Stay away from horizontal or vertical lines running in the same direction as the lens. Use text and lines, which are large enough that they will not be distorted by the texture of the lens itself.

Colors are not necessarily an issue on 3D production. However, it is best to stay away from blacks and stark whites. It is also important to note that warm colors tend to come forward, and cool colors tend to recede.

Forced perspective will enhance the 3D image also, diminishing sizes in the back layers, and increasing sizes in the forefront layers. 3D tends to work best if you are able to see around and through the objects. (i.e.; the aim point layer should not be totally on top of the mid-rear layer).

A comp, whether built in Illustrator or Quark, is necessary to relay the desired effects. Supply layered documents, along with any and all support documents.

Optimally, the file will be built in layers (such as with Photoshop for raster images, and Illustrator for vector images). Type can be converted to paths in Illustrator, but type is not to be rastered, as it would be in Photoshop, unless of course, this is the desired effect of the design.

We are able to separate composite images if that is all that is available, however additional costs will be incurred. (A quote would be available after the art is viewed).

OptiGraphics Lenticular Art Creation Tips

Ghosting

One of the most common obstacles we face in producing lenticular animation is ghosting. We define ghosting as the ability to detect a latent image of one phase while viewing an image in another phase. Although we have made technical improvements to alleviate this problem, minor changes in artwork can greatly reduce the amount of ghosting perceived. Following are some practical tips for preparing art for lenticular animation.

1. Do not use light or neutral colored backgrounds or fields.
2. Make contrast levels the same in all phases. Avoid animating images with high contrast such as changing white type on a black background to black type on a white background.
3. Perfectly align type or logos that do not animate. (i.e.- remains visible during all phases)
4. Replace animating copy or elements in phase 1 with similar elements in phase 2 in corresponding positions. Flips or animations work best if something within the picture changes rather than changing totally from one picture to another completely different picture.
5. Avoid using side-to-side animation. Side to side animation is created using a lenticular lens in a vertical position. The flip or animation takes place when the viewer walks past the lenticular piece or the lenticular piece is rocked left to right. This creates the possibility of seeing a different phase with each eye, thus sending a mixed signal to the brain. When side-to-side animation is necessary, try to follow the above suggestions to help eliminate the ghosting problem.

3-D

Art preparation for three dimensional lenticular is similar to creation of art for any high quality printing project. There are however, some techniques unique to the process. Images intended for 3-D should be prepared in a layered CMYK Photoshop file of at least 300 dpi. Each desired level of depth should be on its own individual layer. Following, is one example of different distribution of levels.

- 1. Aim Point Layer** - This layer will be the primary focal point of the piece. It will be the sharpest point on the 3-D composition and is usually reserved for the key element of the design. A bleed of 1/8" is required for this layer on all sides.
- 2. Rear Layer** - This layer will be the background portion of the 3-D piece. Some detail should be included on this layer to enhance depth. This detail will be

used as a reference to the other layers. This layer will appear soft in comparison to the aim point layer. Items on the rear layer may move beyond the trim of the final image. In most cases this will enhance the effectiveness of the 3-D. Bleed requirements for this layer are 1/8" on top and bottom and 1/2" on the sides. Failure to include this additional bleed will result in added cloning or distortion of the image, which could create an unnatural look or feel as well as additional cost.

- 3. Mid Rear Layer** - This layer will be used to add an additional layer of depth perception and will appear sharper than the front and rear layers. Elements included on this layer should have some forced perspective such as items smaller in relative size to the aim point or converging lines or patterns. This will result in a more natural look to the final composition. An object floating by itself does not provide the viewer with an idea of perspective as much as an object that partially blocks another object that must be looked around. Bleed requirements for this layer are 1/8" on the top and bottom and 3/8" on the sides.
- 4. Front layer** - This layer will be used to show forward projection on the 3-D piece. Items on this layer will appear to project out of the picture toward the viewer. Front layer elements that appear to the left or right of aim point elements will intensify depth perception. Image elements should not trim off the left or right sides, as this will destroy the effectiveness of the forward projection. The further forward items appear, the softer the focus will become. Elements on the front layer should be made larger relative to items on the aim point to help augment the 3-D effect. The rule of thumb for forward projection is 1/3 the amount of depth as the rear layer. Elements on the front layer should be non-obtrusive but should be placed to be "looked around". Items on this layer should not be key to the message such as product shots or logos. Bleed for this layer is the same as the mid rear.
- 5. Animations or flips can be incorporated into a 3-D view.** Animated art should only be included on the aim point layer and should be limited to minor actions of one or two elements. Extreme movement will detract from the 3-D effect and could create a ghosting problem.
- 6. Keep in mind that all lenticular 3-D images are created by moving elements within an image in relation to other elements within that image.** This is what creates the illusion of depth. Rotating elements around a focal point creates a series of different "views" of the same image. The lenticular lens allows us to see two of those views at a time creating a parallax image in our mind. Motion = Depth. The more you move the elements the more depth you can achieve. However, we are limited by the lobe angle of the lens as to how much we are able to move the image. If the background moves too much it will begin to jump and will not look natural.

These tips should be used as a reference guide. Other combinations of layers or additional layers can be utilized. This describes a 2-D to 3-D conversion. Other formats such as computer generated 3-D images or other sequential imagery may be combined to utilize the 3-D lenticular process with dramatic effect. Proper virtual camera and lighting techniques should be used to best incorporate the use of highlight and shadow. Our lenticular specialists are ready to answer any questions related to the process.

Spot Colors

Avoid using a 5th or spot color included in a four-color process animation. PMS colors may be used on static images or background designs that do not come in contact with changing or flip images. Up to 4 spot colors can be used in place of process colors at any time.

Type

Avoid using type fonts that include serifs. Try to use bolder faced fonts of at least 12 points, which will not break up under the lenticular lens. Italic type fonts should also not be used, as the angle of the type tends to create a stair step or saw tooth pattern when viewed through the lens. Type can be converted to paths using Illustrator or Freehand but should not be rastered as it would be in Photoshop, unless of course this is the desired effect. Please include all type fonts when sending electronic files.

General Info

People have come to expect sophisticated, life-like visuals. They have grown accustomed to video games with realistic graphics and animation, and to computer generated special effects for films. Lenticular images can also create dramatic effects, however, some limitations can be expected compared to a backlit computer or video screen. Lenticular animation can only capture a small slice of time whereas when watching a movie or television one can witness all of the action that takes place up to and after that slice. This can limit the amount of "storytelling" that a flat 2 dimensional lenticular will achieve. Lenticular animation is at its best when used to demonstrate "before and after" or "cause and effect" illustrations. It can also be used to communicate several messages in the same space. 3-D lenticular continues to be an attractive alternative to flat 2-D printed matter without the use of special electronic goggles or funny glasses..