INTRODUCTION TO LENTICULAR PRINTING

The aim of this paper is to explain the basics of lenticular printing and offer a guide to further reading to continue learning.
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1 WHAT IS LENTICULAR PRINTING

Lenticular printing is a printing technology which uses a lenticular plastic to produce images with an illusion of depth or the ability to change or move as the image is viewed from different angles.

The following figure illustrates an example of image change:
2 ADVANTAGES OF LENTICULAR PRINTING

- Lenticular images are more attractive thanks to their amazing 3D motion effects, animation, and depth.
- Lenticular images become the focus of attention and remain in the customers’ memory for a longer time.
- Lenticular images can generate a wide range of new printing applications.
3 HOW IT WORKS

3.1  STEP 1

The images are divided into strips and interlaced into a single image.

The width of the strips in the figure is exaggerated for easier comprehension. In reality, these strips are much narrower. For example, in some cases there are 150 strips per inch.
3.2 STEP 2

The interlaced image is printed directly on the back of a lenticular piece of plastic or printed on a stable paper support and then laminated with plastic.
3.3  STEP 3

The lens isolates and amplifies the interlaced image underneath it in such a way that only one original image at a time can be seen. The image changes as it is viewed, depending on the angle of observation.

If the lens array is placed vertically, each eye sees a different image and creates the illusion of a 3D image.
4 WHAT IS BINOCULAR DISPARITY

The observer sees different images depending on the angle from which the lenticular image is viewed.

This feature is key to producing the various desired effects.
5 TYPES OF LENTICULAR EFFECTS

5.1 FLIP

For this type of effect you need two or more very different images. The images will change from one to another as the angle of observation varies. The lenses most suitable for flip effect are those designed with a relatively large viewing angle. This allows the viewer to see the original images with ease, because small movements do not produce any image transition. Only large movements of the observer or of the printed image will cause the transition from one image to another.

5.2 MOVEMENT

This type of effect is composed of several sequential images that differ slightly from one image to the next. The angle from which one sees the same image is medium size. Normally, both eyes tend to see the same image, but small movements of the observer or the printed object can cause a transition to the next image in the sequence.

5.3 3D

The 3D effect requires only very small changes in the viewing angle to bring about change in the observed image. This means that each eye sees a different picture. Due to the human capacity for stereoscopic vision, the brain integrates the two images to generate a 3D illusion without special glasses.
6 WHAT YOU NEED FOR LENTICULAR PRINTING

6.1 IMAGIAM LENTICULAR EFFECTS SOFTWARE

Imagiam Lenticular Effects software covers all needs for generating lenticular effects: pitch\(^1\) calibration, lenticular interlacing (for flip and motion effects) and 3D.

Imagiam website  ⇒  http://www.imagiam.com

6.2 LENTICULAR PLASTIC

Lenstar supplies high-quality lenticular plastics worldwide between 40 and 150 LPI\(^2\). The main markets for these plastics are offset and digital printing. DPLenticular is the official supplier in Europe for Lenstar.

Lenstar website  ⇒  http://www.lenstar.org

DPLenticular website  ⇒  http://www.dplenticular.com

6.3 A PRINTING MACHINE

You can print directly on to the plastic if you have UV technology (offset and digital) or on a paper support which must then be cold laminated with the plastic and a sheet of double-sided adhesive (large format).

The printer's physical resolution is critical when printing lenticular images. This resolution should be as high as possible and print settings must necessarily be activated in best quality mode when printing this type of images.

\(^1\) Number of lenses per inch of the lenticular plastic used in the printing.

\(^2\) Lenses per inch.
7 FURTHER READING

To continue learning about lenticular printing technology it is recommended that you read the following tutorials, in this order:

1. **Pitch.pdf**
   This tutorial will teach you what is the visual pitch of a lenticular image from a theoretical point of view. A good understanding of this concept is fundamental for obtaining good lenticular images.

2. **Calibration.pdf**
   In this tutorial you will learn what lenticular calibration means. Lenticular calibration is a test by which we can calculate the visual pitch of a lenticular image. The pitch value obtained depends on several factors such as the plastic used, the printing equipment, and the distance of observation of the image. A good pitch calibration is essential to achieve a good lenticular image afterwards.

3. **Interlacing.pdf**
   This tutorial will teach you to interlace images for flip effects and movement. Everything you learn about this technique will then be used to produce 3D effects.

4. **3D.pdf**
   In this tutorial you will learn the most important techniques for stunning 3D effects. Before entering this field it is important to have successfully performed the calibration and interlacing techniques.

5. **FlashFiles.pdf**
   This simple tutorial will explain how to convert your Flash animations into lenticular images ready to be published on the web. This tool is very useful for creating galleries with your effects.

6. **Layout.pdf**
   This tutorial is intended for customers who need to print multiple images simultaneously on a single lenticular sheet. If you only print one lenticular image per piece of plastic, you can dispense with the study of this tutorial. But if, for example, you are an offset printer printing multiple images per sheet, it is very important to follow the techniques discussed herein.