

HOLOGRAPHY WOWS US WITH SPECULAR IMAGERY

Have you noticed the increase in the use of holography appearing in a variety of applications in the graphics arts, packaging and promotional industries? Holographic embossed metallized films and paper materials, as well as hot stamping foils, are being used in labeling, flexible & rigid packaging, and commercial printing to produce marketing advantages in terms of eye appeal, brand promotion-identity and counterfeiting security. Holograms have also found widespread acceptance in authentication and in security printing. Applications of stamping foil, photopolymer and embossed stripe & thread are found, on more than two dozen currencies, tickets, I.D. cards, credit/debit cards, etc. A \$1 Billion a year industry, growing at 30% annually, holography is very well accepted in the now second decade of commercialization.

What is a hologram anyway?

A hologram is a dimensional picture or image produced from a model or flat art using a laser light source and a photo-sensitive plate or film.

A number of different hologram types exist. Most of those we see in graphic arts applications are produced by embossing a hologram impression into a plastic, coated paper, or a transparent film substrate. Multi-dimensional vibrant holographic designs are emphasized for viewing by metallizing the substrate. Holograms are also produced on a photo sensitive medium on polyester, glass or acetate substrates. These are most often seen in display holographic applications.

A variety of image styles exist, including:

2-D - An image of two dimensions, length and width.

2-D/3-D - Layered 2-D images, where at least one appears to be behind the other.

3-D - An image with three dimensions, length, width and depth.

Uniform repeating pattern (URP) - "Wallpaper" design of repeating small shapes or patterns.

Diffraction Grating - Rainbow-color 2-D design.

Different techniques can be used to make holograms. 2-D/3-D holograms are made from flat two dimensional photos or line art. 3-D holograms are laser produced exact reproductions of 3-D objects. Recently, computer based dot matrix systems have become popular because they can create a combination of 2D and 3D effects using a collection of small (diffractive) dots or pixels.

Effective holographic design is dependent on five key inter-related characteristics, - lighting, color, depth, viewing angle and multi-channel.

A hologram is said to be a recording of light waves that is replayed or decoded by an interaction with light during viewing. The range of color seen comes from the viewing light being diffracted back to the viewer. Surface imaged 2-D & dot matrix holograms can be viewed effectively in low ambient light. Small 3-D holograms will be viewed adequately with low artificial lighting. The greater the depth and complexity of a hologram, the more point directed and stronger the light source has to be. Large deep image display holograms require a specific spot light and some covert (not visible in standard lighting) holograms require laser, laser diode or LED illumination.

Embossed holograms, metallized or other treatment types, are all white light transmission holograms, giving them their characteristic "rainbow effect". With photopolymer holograms the viewer sees the hologram in a reflection mode, which typically creates a single color image. An image with high contrast is easier to see in a wider range of lighting conditions.

The uniqueness of holograms is evidenced by the fact that the viewer is able to interact with the image. The viewer is able to "look around" an image and see different variable images from different angles. A conventional hologram has a viewing range that extends for 45 degrees horizontally and vertically from its central axis. Most hologram types allow different images to be viewed from different angles. Multi-channeling techniques, allow 2 to 5 changes of adding or subtracting image parts, as one views an image from left to right, one channel to another.

Holographic hot stamping foils consist of a PET carrier film which is, in order, release, hard and soft lacquer coated, metallized, embossed and finally heat activated adhesive coated. Like conventional hot-stamping foils, they can be applied effectively to most smooth, coated paper and paper board substrates, unprinted or printed, aqueous coated or overprint varnished. Hologram hot stamping foils may also be applied effectively to some plastics or UV/EB coated substrates.

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While it is always recommended that hologram hot stamp foils be tested over various inks and coatings to insure adhesion integrity, it has been found that most aqueous coatings provide good adhesion.

Holographic materials are commonly surface coated with aqueous coatings to raise the surface energy to dyne levels of 40+ so that various printing inks will be accepted. After printing it is common practice to top coat with aqueous or UV/EB coatings for protection and abrasion resistance.

Holographic embossed coated, metallized, wide web films (PP & PET) and paper for laminating and labeling are available. Casting of images into UV coatings is also done. Holographic films are being in-line adhesive laminated to paperboard and other substrates for further converting into packaging and other products. Print accepting coated label substrates, film and paper, are available for printing and/or lamination in label converting. A wide range of holographic materials are also being used by the flexible packaging industry.

Holograms are more costly than commodity packaging and labeling materials. With advances in production and application technology, however, these costs are dropping and often sales improvements more than off-set the added cost.

Currently, holographic film costs approximately 5 times more than that of metallized film. Holographic paper may be 2-3 times the price, and holographic laminated board may cost twice as much as mirror board. Data from toothpaste packaging applications suggest that making the carton holographic may double the price of packaging but adds less than 10% to the overall product cost. Sales data show that this incremental cost is more than made up in sales and revenue increases. With the value adding visual effects, holography has added sparkle to the toothpaste isles and will be appearing on many more products in the future.

Holographic products are available for hot stamping, labeling and laminating. Holograms and holographic materials may be applied to a wide variety of graphic arts materials.

Whenever you consider pre-coats, top-coats, or varnishes used in holographic substrate production & converting, consider **CORK!**

LOOK TO CORK! for all of your coating and varnish needs, for both aqueous & UV/EB coatings and vanishes.

Holo-Pack-Holo-Print '99, the Tenth Annual International Holography Conference and Trade show will take place November 18-19, 1999 at the Marriott World Trade Center in Orlando, FL. Organizers, Reconnaissance International (800.741.6552 or +1 303.806.0071), and Pira International (44 (0) 1784 497008), have also organized the first ever Effective Holographic Packaging Design Workshop, for November 17. Web <http://Reconnaissance-Intl.com>.