



Imation AquaGuard™ Technology

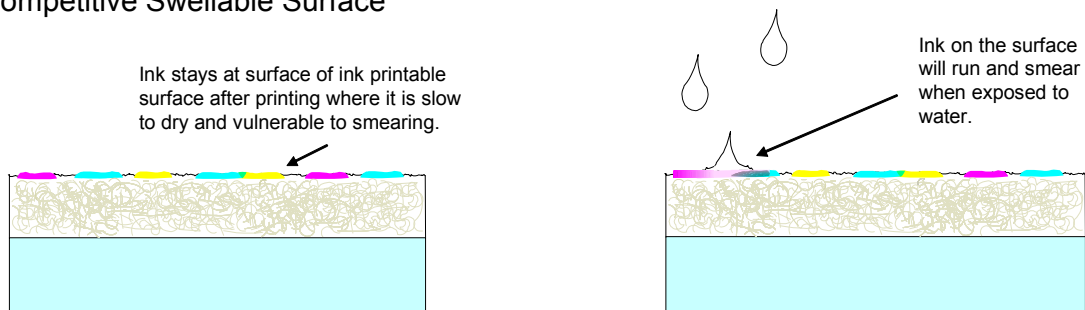
This White Paper is intended to provide some background information on Imation's AquaGuard™ Technology. AquaGuard technology is an inkjet receptive surface applied to the non-data side of optical discs.

The Imation AquaGuard inkjet receptive surface provides the following benefits to the user:

- Excellent image quality with bright, vibrant colors;
- Superior resistance to image running and smearing when exposed to water;
- An inkjet printable surface with a uniformly high level of whiteness from the hub to the outer edge of the disc;
- Quick drying of the image printed on the disc.

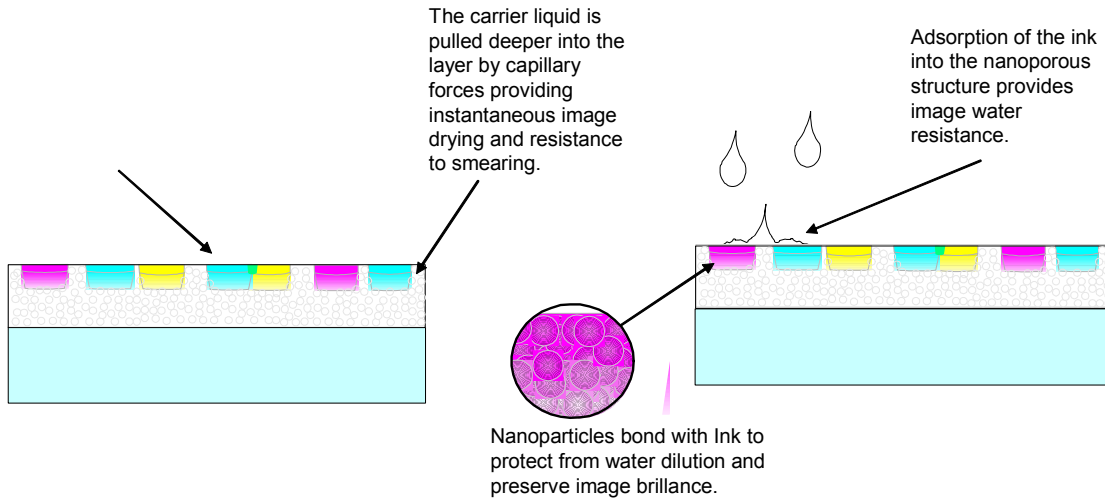
Currently available inkjet printable discs are made with a polymeric swellable inkjet receptive coating. This coating accepts the inkjet printed image by swelling to absorb the ink carrier liquid similar to the way a sponge absorbs water. The ink carrier liquid then slowly evaporates over time leaving behind the colored ink material at the surface of the inkjet receptive surface. It can take many hours for the image to completely dry during which it can be smeared if rubbed. Since the image is not fixed by a swellable surface, rewetting of the image will cause it to run and smear.

Competitive Swellable Surface



Imation AquaGuard™ inkjet printable surface uses a nanoporous inkjet receptive surface in which the porous ink receptive coating is made from ceramic particles. This nanoporous surface absorbs the ink by capillary action. The advantages of the nanoporous surface are that it is very fast drying and water resistant. In addition, the Imation AquaGuard surface has been formulated to be whiter than currently available standard inkjet receptive optical disc coatings.

Crystal Inkjet Receptive Surface Nanoporous Technology



Water Resistance

The key advancement in Imation AquaGuard™ technology is bringing the water resistance of a nanoporous inkjet receptive surface to optical discs. This will assure that an image printed on an Imation AquaGuard disc will retain its legibility and quality even when exposed to water.

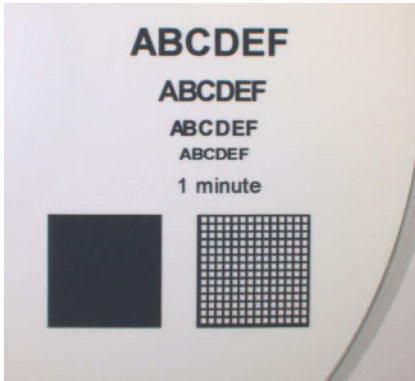
The following photos show the water resistance of the Imation AquaGuard inkjet receptive surface. A test image was printed on both a competitive swellable inkjet printable disc and an Imation AquaGuard inkjet printable disc. A drop of water was placed on the upper set of color blocks, allowed to set for 10 seconds and removed by blotting. You can see noticeable water spotting on the competitive printable surface while there is no visually water spotting on the Imation AquaGuard disc. On the bottom set of color blocks the water drop was removed by wiping after sitting on each of the color blocks for 20 seconds. You can see the water spotting and smearing of the color blocks on the competitive inkjet printable disc while the color blocks on the Imation AquaGuard discs remain virtually unchanged.



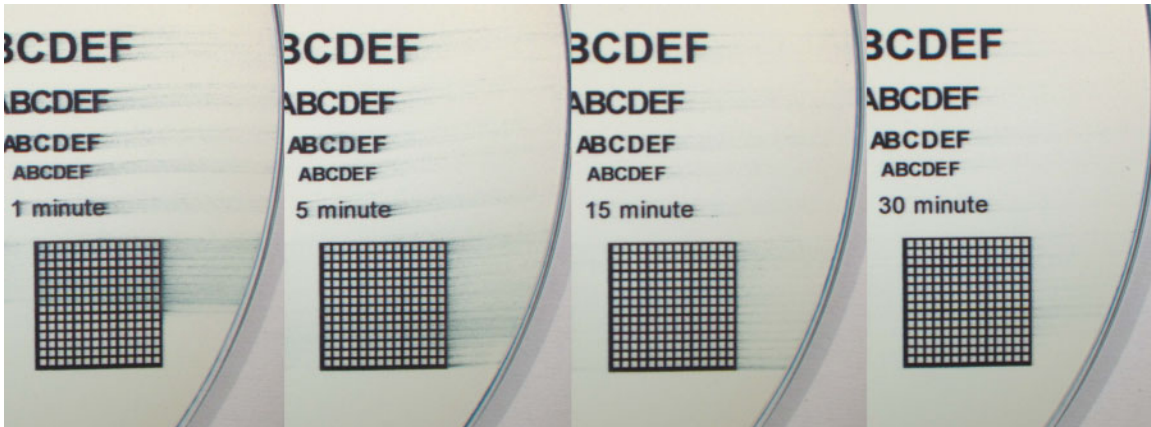
Drying Time

The absorption of the ink by capillary action on the Imation AquaGuard™ surface provides an image that is dry when it leaves the printer. This prevents the image from being smeared when the disc is removed from the printer and also prevents ink from being transferred to the hands of a person printing discs.

To illustrate the quick drying of Imation AquaGuard discs a test was performed in which a cloth was dragged across the surface of a printed disc at various time intervals after it had completed printing. The results are shown in the following photos. These photos show that the image printed on the Imation AquaGuard disc is not smeared when tested 1 minute after it has completed printing while the competitive inkjet printable discs shows obvious smearing at 15 minutes and slightly visible smearing 30 minutes after printing has been completed.



Imation AquaGuard text and graphics 1 minute after printing, dry cloth smear.



Competitive samples at 1 to 30 minutes after printing, dry cloth smear.

Whiteness

The Imation AquaGuard™ has been formulated to provide a whiter surface than competitive inkjet printable optical discs with good uniformity of the white surface from the hub to the outer edge of the optical disc. The whiter surface of the Imation AquaGuard disc results in an image with brighter, more vibrant colors.

The whiteness of the inkjet receptive surface was measured using the C.I.E. L*a*b* color space. In this color space the L* dimension is a measure of the lightness-darkness of the color being measured with an L* reading of 100 indicating a completely white surface and an L* reading of 0 indicating a completely black surface.

L* measurements were made of a variety of competitive inkjet printable discs and an Imation AquaGuard disc using an X-rite 500 series spectrodensitometer.

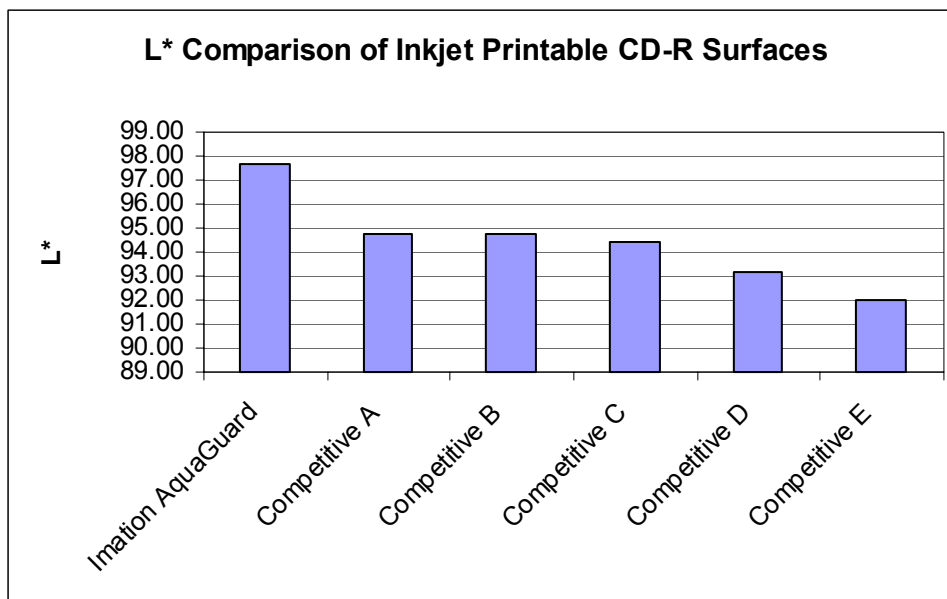


Image Quality

The combination of quick drying in which the ink is absorbed before it can spread and degrade the sharpness of the image and the whiter surface giving brighter, more vibrant colors results in excellent image quality. When compared to images printed on competitive inkjet printable discs, images printed on an Imation AquaGuard disc have good resolution and sharpness and appear brighter.

Conclusion

Imation AquaGuard technology brings water resistance to inkjet printable optical discs. In doing this Imation AquaGuard provides the following benefits to the user:

- Excellent image quality with bright, vibrant colors;
- Superior resistance to image running and smearing when exposed to water;
- An inkjet printable surface with a uniformly high level of whiteness from the hub to the outer edge of the disc;
- Quick drying of the image printed on the disc.

With inkjet printable discs using Imation AquaGuard™ technology you can be assured that the image printed on your disc will be of the highest quality, resistant to damage by handling when freshly printed and resistant to smearing when exposed to water.