

A Moment to Last Three Centuries



Michael Castelluccio, Editor

■ THE WORLD'S OLDEST PHOTOGRAPH is a four-by-six image taken by Joseph Niépce in 1825. So, how are the photos from your digital printer holding up? With all the advanced technology, do you think your prints will still be recognizable in 181 years? Niépce was working with a copper plate covered with bitumen, and he developed his postcard-size piece of history (sold recently for \$392,000) with oil of lavender and white petroleum. Those tanks in your inkjet—are the inks long-lasting, or will the same light that helped you take your pictures fade them away to white paper if you put them on a wall? Perhaps you should give some thought to archiving your collection.

With conventional photography, archiving means printing on special papers, storing in acid-free folios, and a cool, dark place for your negatives. For digital, it usually just means burning a backup CD.

Until fairly recently, that would mean almost any CD, but much has changed with the emergence of digital rot—the

CD world's equivalent of the dreaded flesh-eating disease. Well, maybe not as dreaded, but if the last images of the great grandparents are on a disc that becomes unreadable because of pinholes, that's at least a genealogical catastrophe.

How Can Plastic Rot?

Jerry Hartke manages Media Sciences, Inc., a lab that tests CDs. He explained in a *USA Today* article, "The aluminum layer that reflects the light of the player's laser is separated from the CD label by a thin layer of lacquer. If the manufacturer applied the lacquer improperly, air can penetrate to oxidize the aluminum, eating it up much like iron rusts in air." A more likely explanation, according to Hartke, is that any abuse that disturbs the protective layers can expose the aluminum to the air—bending, stacking, rubbing them together, or writing on the label with a sharp pen. The discs are more vulnerable from the top because

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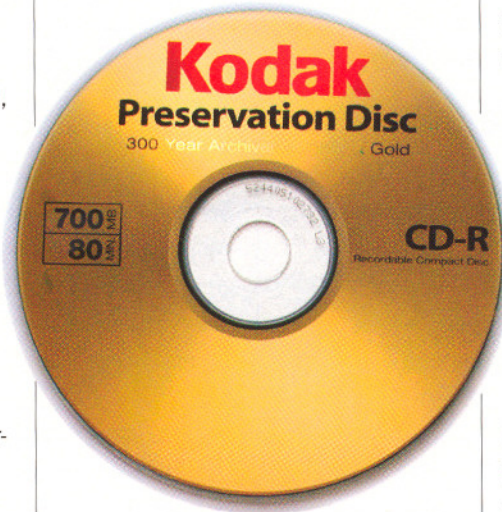
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the bottom layer has a polycarbonate covering. On top there's the thin label, then a layer of lacquer sprayed over the aluminum that sits on top of the thickest section, the polycarbonate bottom. The actual recording track spirals from the hub outward, and if you could strip it away from the layers, it would stretch out to an incredible length of about 3.5 miles. That's quite a vulnerable front—or track.

So, how long can a CD or DVD last? The numbers are all over the place. In a company newsletter, Roxio, a producer of disc-burning software, offers a few contrasting views. According to the Optical Storage

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Technology Association (OSTA), “CD-R manufacturers have performed extensive studies with results claiming longevity from 70 years to over 200 years.” The newsletter then quotes a *U.S. News & World Report* article that “draws the startling conclusion that unless you buy certain high-quality brands, your CD-R discs may last as little as two years.” The National Media Lab has some complaints about the methods used by the magazine, but there are others who agree with the results. On MIT's Technology Review blog, Kurt Gerecke, a physicist and storage expert at IBM Deutschland, was quoted making the same claim: “Unlike pressed original CDs, burned CDs have a relatively short life span of between two to five years, depending on the quality of



Kodak's Archival Gold

the CD.” Gerecke added, “There are things you can do to extend the life of a burned CD, like keeping the disc in a cool, dark space, but not a whole lot more.”

Finding high-quality discs manufactured with the best materials can be a challenge. Because companies change materials from time to time, you really need to know which factory your disc came from and how to rate each.

Because few are going to do that, let's look at this another way. Since the material that's most likely to fail is the metal lining, what are the choices here? Aluminum will corrode (rot) most quickly. Silver is better, but it also tarnishes when exposed to the air through scratches or the polycarbonate layer beneath it. Yes, it's true, that plastic bottom side is permeable and will allow oxygen to pass through. The most stable element to use for the metallic layer that reflects the laser light would be gold, preferably 24-karat gold.

That leaves the top, the bottom, and one element we haven't looked at yet—the dyes in the recording level. This layer is applied on top of the polycarbonate layer, and it is burned to reflect the digital pattern of the data being recorded. There are several

kinds used, and all will fade over time—some more, some less. Cyanine is the most common and least permanent. It appears as light green or blue.

All of which brings us to the Kodak 24k Gold Preservation CD. A museum in a jewel case. The recording dye used on these lifetime discs, patented by Mitsui, is called Phthalocyanine. Combined with the other quality elements that go into the disc, these Preservation CDs will last up to 300 years under the proper storage conditions, Kodak claims.

An obvious question is how do you get 300 years? Were these discs tested in a time machine? Well, sort of. It's called accelerated aging. Kodak explains, “The estimates are based upon results from industry standard environmental chamber tests that subject the discs to 85% relative humidity and 80 degrees Celsius (176 Fahrenheit) for 2,000 hours. The Light Fastness Test shows the discs will withstand the full spectrum of light, same as the sun, for over 100 continuous hours without damage.”

Another amazing thing about the Preservation Discs is the price. They retail for about \$3 each and are available in spindles of 25 for \$50-\$55. The prices will move around because of the volatility of the gold market, but your final cost is about a buck for 100 years.

Want to create a world's oldest photograph—that is, from your own world? No copper plates or salves and oils—just archive a few fleeting moments from your own life onto a Preservation CD, and put it on a shelf for your descendants in 2306.

Kodak also offers DVDs in the Preservation format.

(www.kmpmedia.com).