Subject: Tim Grey's DDQ - 4/6/07
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Digital Darkroom Questions e-mail list
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Any thoughts on the new Memorex Pro Gold Archival DVD-R's or the Delkin Archival Gold "100-Year Disc"?

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I do have thoughts, indeed. The bottom line is that I don't completely trust any storage medium. Therefore, I consider it critical to have a solid backup system (one that creates a duplicate copy of all your important data reliably). It is also critical to actually check your storage periodically to ensure you're able to read it. For example, if you archive images off to other storage, you should try to read the data from that storage media periodically. In other words, you should always have two copies of your data and you should check both of them periodically to ensure the data is still readable.

To give you a short answer, the highest rated discs use stable dyes and reflective layers, and therefore minimize the risks of data loss over time. I would never expect the disc to last 100 years, and not even ten years in most cases. But you don't need the disc to last that long. In ten years you probably won't be using DVD media anymore, let alone CD media. So if they say 100 and you only trust them for ten, you're probably still in pretty good shape. If you have decided optical media is a good solution for you, then you want the best discs. The discs you refer to are very good, and I also like the Verbatim DataLifePlus line of discs.

With that in mind, it is certainly reasonable to use optical media (CD and DVD) to store your images. I don't personally find optical media to be a great solution (I prefer external hard drives), but there are certainly situations where optical media make a lot of sense. In those cases, you'll naturally want the very best reliability, even if it is just for discs you'll send to a client and that only need to last a few weeks or months at most.

When it comes to the reliability of optical media, two of the key factors are the reflective layer (the shiny material that actually reflects the laser back to the sensor in the CD or DVD drive so it can read from the disc) and the dye used to actually record the data (the light-sensitive dye that the laser in the CD or DVD drive "burns" in order to define a difference between "on" or "off" to create the "ones and zeroes" of the actual data). If either the reflective layer or dye are not stable, the data is not safe. There are, of course, other risk factors. The outer substrate could crack, craze, or start to become more opaque, the disc can be physically damaged, or any number of other potential

causes of damage resulting in data loss. But if we assume the rest of the disk is high-quality and it will be stored and handled properly, the reflective layer and dye become the key factors.

The discs that are rated the best (the Delkin discs claim to be 300-year discs, by the way, not the 100-year you refer to) use the most stable and highest quality dyes and a reflective layer that is as inert as possible. There are only a handful of dyes used in all of the optical media produced (there actually aren't all that many companies producing discs, they just get branded differently). The top discs use highly stable dyes, but there are still limits on how long they will maintain readability in the disc (the primary risk being that the dyes will fade over time making the data on the disc unreadable). The reflective layer must also maintain its reflectivity in order for the data to be read. Very cheap discs use inexpensive materials that oxidize quickly, and therefore have a high risk of not being readable. The best discs utilize gold in the reflective layer to ensure the reflective layer doesn't oxidize too quickly (most discs that have a gold reflective layer don't use pure gold, but rather a gold alloy, so they aren't as stable as you might otherwise expect, but still very stable).

So, there is certainly some marketing hype behind the claims of these optical discs, but there is also some pretty good science behind them too. I wouldn't trust any storage media completely, but if you want to use optical discs these are among the best available.

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