

DVD MEDIA GUIDE

Not all media is good. In fact, with the high influx of cheap media from Taiwan and Hong Kong, I'd venture to say most media is bad. This guide is meant to shed some light on the how and why of DVD media quality.

This guide also gives examples of what generally works as the best media, but your mileage may vary, depending on the burner and how that batch of media chooses to cooperate. While some cheap media may work for you, it's a gamble that often loses.

Who makes the disc: Brand vs. Media ID

The thing that must be realized is that most media is produced by a relative small number of factories, located in several different places. These factories are present in Taiwan, Japan, Singapore, Mexico, Hong Kong, India, and Ireland... maybe a few more, but not many. The best media generally comes from Japan and Singapore. The worst typically comes from Taiwan (in stores) and Hong Kong (online).

This being said, understand that the media **brands** means nothing. Apple is a great brand, but they do not make their own discs, instead outsourcing to MXL (Hitachi/Maxell), MCC (Mitsubishi Chemicals), and PVC (Pioneer). Verbatim became infamous by switching from high-quality MCC to ultra-cheap CMC (CMC Magnetics) media, although they have since returned to using MCC. Companies like Memorex, Fuji and Imation all outsource to media vendors.

Always be aware of fake media too. Fake media is normally sold in flea markets, on eBay and online. This fake media normally has no brand markings and the company being faked normally only sells branded discs.

Media ID Quality Guide

1ST CLASS MEDIA

Almost flawless burns with 95-100% reliable results:

MXLRG01, MXLRG02 = Maxell = (-R)(-RW) ... be aware of fakes

TAIYOYUDEN, YUDEN, TYG01, TYG02 = Taiyo Yuden = (-R)(+R) ... be aware of fakes

MCC = Mitsubishi Chemicals = (-R)(-RW)(+R)(+RW)

TDKG02, TTG01 = TDK Corp = (-R)(-RW) ... be aware of fakes

2ND CLASS MEDIA

Decent discs, though not perfect, about 80-95% success rate:

PRODISC = Prodisc Media = (-R)(+R)

INFODISC = Infodisc Media = (+RW)

SONYD04 = Sony = (-R) ... be aware of fakes

RICOHJPN = Ritek or Ricoh = (+R)(+RW)

RITEK = Ritek = (+R)(-R)(-RW)(+RW)

OPTODISC = Optodisc = (-R)

FUJIFILM = Fuji = (-R)(+R)

3RD CLASS MEDIA

Quality can be very questionable, about 50-80% success rate:

LEADDATA, LD01, LD, LEDA = Lead Data = (-R)(-RW)

BEALL = Samsung BeAll = (-R)(+R)

MBI = Moser Beaur (India) = (-R)(+R)(+RW)

PRINCO, fake TDK = Princo = (-R)(-RW)

ONIDTECH = Unknown OEM = (-R)

MUST = Unknown OEM = (-R)

GSC001, GSC002 = Unknown OEM = (-R)(+R)

4TH CLASS MEDIA

Pathetic garbage media, landfill material, about 0-50% success rate:

RITEKG01, RITEKG02 = Ritek = (-R)

CMC, CMC MAG = CMC Magnetics = (+R)(-R)

PIODATA, PIO = LeadData, Ritek = (-R) ... once sold as "Pioneer" but that's false

Fake SONY, MXL = Fake Sony/Maxell from Hong Kong OEM (Infosmart?) = (-R)

OPTODISC = Optodisc = (+R)(+RW)

AN31, AN32, ANWELL, AN30 = Hong Kong OEM (Infosmart?) = (-R)

INFOSMART = Hong Kong OEM = (-R)(+R)

VANGUARD = Unknown OEM = (-R)

YIJHAN = Hong Kong OEM = (-R)

MATRIX = Hong Kong OEM = (-R)

VDSPMS = Unknown OEM = (-R)(+R)

LONGTEN = Hong Kong OEM = (-R)

What do the % numbers mean? This list is constructed from many tests on many burners from a handful of experienced people that use a lot of media. These numbers reflect the number of discs in a spindle that will give good results. For example, out of a 100 spindle of media, 1st class discs may kick out a few bad discs (0% to 5% of the media may have playback imperfections or be outright bad burns). The 2nd class media may have a dozen or so bad discs. The 3rd class discs could give you a half-spindle of duds. And the 4th class stuff can be pure trash. **These are mean averages too**, simple statistics math, meaning best tests and worst tests are discarded, and the middle range of tests is the basis for these numbers. You may sometimes find the rare instance where a CMC spindle will be perfect and a Taiyo Yuden spindle will be completely flawed, but those times are the exception rather than the rule (and are not part of a mean average).

Testing procedures: Burns are subject to playability/reflectivity tests (usage tests), as well as software verification. Test equipment is under controlled hardware/software environments to eliminate user variables. Burns are at least 4GB or more to test the entire length of the media.

Branding Guide

Accu = LEADDATA
Americall = RITEKG01, PRINCO, LEADDATA
Apple = MXL, MCC
Arita = RITEKG03, RICOHJPN
Bulkpaq = PRINCO, PRODISC
CompUSA = PRINCO, OPTODISC, LD
Datawrite = PRINCO, PRODISC, AN31, RITEKG03
DupEZ = PIODATA, LEADDATA
Esbuy = RITEK, LEADDATA, other budget IDs
Fuji = TAIYOYUDEN, MCC, RICOHJPN, PRODISC, FUJIFILM
GQ = PIODATA, PRINCO, RITEKG03, RITEKG02, LEADDATA, LD
HP = CMC, RICOHJPN, MCC
Imation = RITEKG03, CMC
KHypermedia = CMC, TTG01
LiquidVideo = OPTODISC
Matrix = MATRIX, LONGTEN, YIJHAN, MUST
Maxell = MXL, RITEK, RICOHJPN, TYG01
Memorex = CMC, RICOHJPN, PRODISC, INFODISC
Meritline = Various budget IDs
Mirror = AN31, ONIDTECH, PRINCO
Optodisc = OPTODISC
Philips = CMC
Pioneer = PVC
Princo = PRINCO, Fake TDK
Prodisc = PRODISCS03, MCC
Ritek = RITEKG01-04, RICOHJPN
Samsung = TYG01, BEALL, RITEK
Sonic, Shop4tech = LONGTEN, MATRIX, MUST, YIJHAN, various budget IDs
Sony = SONYD04, RICOHJPN, MCC
Supermedia, Linkyo = Various budget IDs
TDK = TDK, RITEKG04, RICOHJPN, MXL, CMC, MCC
Verbatim = MCC, CMC, TAIYO YUDEN, RICOHJPN, RITEKG03

Speed: Media ID vs. Write Strategy

The Media ID is the location of information about the disc. Much like the disc maker's name in the ID code, the write speed can be faked. The Write Strategy is the maximum speed the disc was manufactured to use. Burning faster will often lead to errors.

Unfortunately, most DVD-R (and I believe this also applies to DVD+R) drives read the Media ID for determining write speed allowed by the burning software. You should always check the WRITE STRATEGY to ensure the Media ID is not forged for an incorrect speed. Most of the media listed in the "normally bad or questionable" category are guilty of placing 2x or 4x media ID speeds on discs with 1x write strategies.

Why discs are "bad" or "go bad"

DVD media is still new, and methods for creating faster and better discs are always being perfected. Discs are created in an interesting manner (note that this is a basic description). Plastic is laid down, then metal reflective foil, then dyes are poured onto the foil. Another plastic is laid on top, then the disc is spun at high speed to spread out the dye, hopefully evenly. It even sounds like an unstable method!

Dye imperfections. Bad foils and dyes, as well as *bad dye spread* are the most common issue that causes bad media. If the dye is uneven or does not reach to the edge of the disc, it is often bad. CMC is known for bad inner-disc spread (dye thinning) and Princo is known for not reaching the edge (short spread).

Problems past the 4GB mark. *Balancing* is also a side effect caused by faulty plastic, foils or dye spread. A disc spins faster on the outside than it does on the inside (ask any college physics professor). And round objects tend to be most unsteady at the outside. While DVD media allows for some degree of error (data is written in a "wobble groove"), exaggerated wobble will cause the laser to spew data in areas not meant for writing. It thus disappears, and the data comes up as missing on the disc, resulting in freezing, blockiness and other odd visual errors (caused from the decoder attempting to compensate for material that is missing). **Simple explanation: bad disc.**

Fake media. Fake media is often bad. If you ever acquire good media like TDK, RITEK or MXL, and the results are bad, check to see if the media is legitimate. Many of these top-tier media companies only have branded discs, not plain white-top or silver-top ones. TDK, MXL, and RITEK have been spoofed before. These discs often are cheaply-made unbranded 1x media with fake 2x or 4x Media ID speeds and maker ID codes.

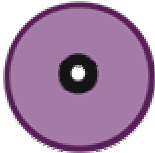
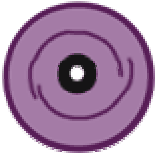
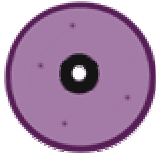
Gradual data loss. Also known as "disc fade" and "laser rot", this is actually not very possible due to the mechanics of DVD recordable media. Terms like "disc fade" and "laser rot" only apply to pressed media, which are altogether different from recordable media in structure and physical/chemical properties. These theories are still widely argued, and applied only to the corrosion of the metal discs. The only feasible explanation for burned media "rotting" would be a breaking of the vacuum enclosure of the disc, allowing air and moisture to permeate the metal and dye. But such chain reaction would occur fairly quickly, not at a gradual pace of months. **Simple explanation: The likely reason people face "disc rot" is that they simply did not check the media when it was first burned. Or the player/reader is now dirty, and not related to the disc at all.**

Dye melting from excess burn speed. Some discs simply cave in under high speed burns. Optodisc 4x DVD-R media is known to corrupt on 4x burns. Some recent April 2004 RITEKG04 media are reported as doing this too. The dye simply cannot handle the write speed. Poor production is to blame. This happens mostly on bad discs, but can also happen on good discs due to user error. Many hacked firmwares and poorly-written firmwares will allow a user to burn a disc faster than its write strategy and media ID speed. The side-effect of these illegitimate burns is ruined dye. The dye appears discolored or otherwise unusual.

Not a media error. This is another very frequent "problem" with discs. The simple fact is not every player or DVD-ROM will read a burned DVD media. Some players were not made to play anything other than official to-spec pressed metal discs. Non-media errors may also include players that have a weak laser or a dirty laser. A non-playing disc is not a sign of a "bad" disc, but rather just means that particular player/ROM cannot play it. Run real tests to see if the disc is truly a coaster. Also be aware that some formats are more compatible than others (with DVD-R being most compatible of them all for DVD-Video content). This is often called a *reflectivity error*. This is not necessarily the media's fault.

How to see tell-tale signs of a bad disc

Although it is not a scientific means of finding flaws in media, simply viewing the burned side of a disc can reveal potentially flawed media. Bad spots and thin areas of dye can easily be seen by the naked eye.

		
This is a typical disc, a good burn with zero visible flaws in the dye.	This disc shows signs of a bad dye spread or dye melting. In most cases, this is a guaranteed bad burn, and will be entirely unreadable near the middle of the disc.	This disc shows blemishes on the dye. It was either a faulty disc or it had dirt/lint on it while being burned. These areas are normally damaged.