

CD's are produced in multimillion dollar factories at the rate of about one every three seconds. A CD is a thin layer of aluminum sandwiched between two layers of plastic. The aluminum has "pits" stamped in it. Variations in reflectivity as seen by the player's laser are then read as "1s" and "0s". "0" is the absence of reflectivity. The digitized information is electronically converted to music or data and "read" by the playback machine. CD "players" have error correction schemes which allow for playback of scratched media. The errors are still there, but the players fill in the missing data with interpolated data. Scratched media is more problematic with data discs.

CDR TECHNOLOGY was invented by Taiyo Yuden in 1988. It didn't become popular until the cost of "recorders" started decreasing around 1994. In 1991 the Sony/Sonic Solutions PMCD mastering workstation began to replace expensive 1630 tape for creating factory "Glass Masters" for factory replication. The 1630 machines were very expensive, so until 1991, the technology was restricted to only a few facilities.

CDR MEDIA in 1991 cost about \$40/each. By 1995, media costs dropped to about \$15, in 1998 CDR blanks were about \$3, and today they're less than a fifty cents apiece. The Digidesign-Macintosh MasterList CD software became the second alternative for producing Masters. Today there are numerous hardware/software combinations, but the Sonic and Digidesign MasterList CD still remain the leaders with respect to overall quality. (GDA uses MasterList CD for Mastering). CDR media quality can vary. Poor quality media can cause increased playback incompatibility. GDA uses quality Taiyo Yuden CDR media. There are new alternate shapes and sizes of CDRs, business card, mini CDR, custom shapes, but none of these are produced by the major manufacturers and these media are generally poor quality and not recommended.

CDRs are made of a thin viscous layer of photosensitive cyanine dye sandwiched between two layers of plastic with an aluminum reflective layer just like a CD. But unlike a Factory CD which is "stamped", the dye layer in the CDR is actually melted (the popular term is "burned") to create a nonreflective mark that corresponds to a Factory CD's stamped pits. A CDR's mark (burn) simulates a CD's pits and fools the playback machine into believing its seeing a CD !!! **EVEN THOUGH IT'S HEARD OFTEN, YOU CAN'T BURN A CD!** TRUE CD's are pressed in factories, and CDRs are written (burned) in single/multiple recorders. The practical differences between CDs and CDRs are time, cost, minimum quantity, and overall reliability. CDRs can be produced quickly in small quantities. CD Replication can take anywhere from 4-7 weeks depending on how much time is spent with Mastering, Artwork Film, Printing, Proofing, and Replication. Some audio players may not play CDRs. Cheap, or dirty machines are the usual culprits, especially car players and cheap boom boxes. Average playback incompatibility is about one in a thousand, although it's weighted heavily towards the low end, and playback issues at radio stations, record companies, or even average quality players is quite rare. **PREMIUM QUALITY MEDIA** reduces playback compatibility and has greater longevity as well as being more resistant to scratches and mishandling. CDs can last literally forever, whereas the estimated life expectancy of CDRs (because the cyanine dye degrades over time), is generally believed to be around 50 years. Cheap media may only last 10 years. CDRs are prone to damage from scratches or heat and should be handled with care.