



CD/DVD

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This information is to help the members of the Las Vegas PC User's Group understand more about CD/DVDs. It scratches the surface on the amount of information available.

Most of your CD/DVD storage is from a company named Verbatim. This company was started in 1969 and today is one of the most recognizable names in the data storage industry. Verbatim is a subsidiary of the Mitsubishi Chemical Corporation. To put together this report, I used Verbatim information.

Verbatim has a Limited Lifetime Warranty on its products. It is warranted to be free from defects in materials and workmanship. If found defective, it will be replaced at no charge to you. Return the original product with the original cash register receipt to the place of purchase or contact Verbatim at 1-800-538-8589.

CD Products

What does it mean when a CD-R disc says '52x700mb' ?

52x is the maximum speed at which the CD was manufactured to be written. A CD/DVD burner will read this speed from the disc. 52x is the common speed available at this time. It's the speed at which your drive writes data to the CD and the speed in which the CD Media can *burn up to*. For example, a DVD that shows 8X media, means it can burn at speeds of 1X, 2X, 4X, to 8X.

The time is based on how long it would take to play the data if it were a music CD. The writing speed of a CD-R is in multiples of 150KB/s. So an original 1x burner (a museum piece these days) could burn at a rate of 150KB per second. A full disc (700MB) therefore took around 75 minutes to burn, which corresponds to the playing time of a similar size audio CD.

700 MB is the capacity of the CD. If you want to store music, then you can store amounts depending upon the size of the song. The normal size of a song is about 2 MB per minute (in MP3 format) which means that a four minute song would take up 8 MB and around 85 songs could be stored.

The quality of the files burned is unaffected by speed, but the durability of them on various disc types can be. Some drives are better than others at burning a disc that can be easily read, and some discs themselves are much better than others (disc-quality is the single most important factor). If in doubt and want to ensure the highest-quality burn, you can't go far wrong by forcing a CD to be burned at 16x speed in the software being used. That is pretty much optimal as it ensures the disc is never being burned so slowly that is below the disc's intended usage range, but also that the drive doesn't spin up to a higher speed which increases vibrations

which can reduce the burn quality. Burning at 16x instead of 52x normally only carries about a two minute penalty, a small price to pay for a disc which is likely to last longer due to being burned better.

Item	Description	Capacity/Speed
CD-R	Verbatim CD-R media is tested and certified by leading 52X drive manufacturers. These high-grade discs deliver reliable recording even at blazing drive speeds, completing a full 700MB/80min recording in less than 2 minutes. Combining this level of performance and excellent reliability, Verbatim's CD-Recordable media are the ideal storage medium for recording and sharing any combination of digital images, music, desktop files and more.	700MB/52X
Lightscribe CD-R	LightScribe Direct Disc Labeling is a new technology that offers consumers a simple, no-hassle way to burn professional, silkscreen-quality labels on their CDs. Using the same laser that burns data in their disc drives, customers burn their data as always, flip the disc over, re-insert it into the drive and burn a precise and permanent iridescent label. Labels can be burned wherever and whenever a disc is burned, no need for a printer	80MIN 700MB 52X recording speeds 1X to 52X
Digital Vinyl CD-R	Ideal for creating distinctive music, video clips, digital photo albums and marketing CDs, each disc looks and feels like a 45-rpm record that has received the music industry's coveted gold or platinum award. □ Gold and platinum vinyl design CD-Recordable disc □ Retro design with the performance of optical technology □ Ideal for LPTO-CD recordings, original music recording/mixing, unique appearance for distribution of presentations/artwork	80MIN 700MB 52X
Photo CD-R	Verbatim Photo CD-R is the ideal storage solution for archiving digital images. Each disc is manufactured with Verbatim's proprietary AZO recording layer technology, which secures original quality of digital images while providing optimal read/write performance. To protect the recording layer, a Crystal coating has been applied to the label surface to prevent scratching that may occur during labeling or everyday handling. These two technologies are essential for maintaining the quality of your digital images. So whether you are weekend photographer or a professional, store over 1,200* of your favorite digital images. *Based on typical image size of 500 KB. Image size will vary based on camera model and compression mode.	700MB/52X 1200 photos
Music CD-R	Verbatim CD-R media is tested and certified by leading 52X drive manufacturers. These high-grade discs deliver reliable recording even at blazing drive speeds, completing a full 700MB/80min recording in less than 2 minutes. Combining this level of performance and excellent reliability, Verbatim's CD-Recordable media are the ideal storage medium for	80MIN 700MB 40X

	<p>recording and sharing any combination of digital images, music, desktop files and more. High Fidelity audio recording. Compatible with a wide range of recorders, players and computers. Certified for recording speeds 1X to 40X .</p>	
Archival Grade CD-R	<p>Use Verbatim UltraLife™ Gold Archival Grade CD-R media to preserve your family photos and important records as well as critical data. Each disc is manufactured using proprietary unique Dual Reflective Layers (DRL) to maximize both compatibility and longevity.</p> <p>Verbatim's proprietary dual reflective technology is comprised of a silver layer for broad compatibility and a gold layer for long archival life. The highly reflective silver layer allows the UltraLife CD-R disc to look like a standard silver disc to CD burners. This feature provides a low initial error rate, important for long archival life, and the same drive read/write compatibility as standard silver-only discs.</p> <p>The gold reflective layer is naturally resistant to corrosion. The gold layer overlaps the silver layer and prevents oxygen from coming through the lacquer layer or edge of the disc and corroding the silver. Silver oxidation can be a primary factor which limits the lifetime of CD media.</p>	700MB/52X
Pocket CD-R	<p>Only 3 inches (8 cm) in diameter, these cool, colorful discs will record up to 21 minutes of music, graphics, digital video clips, or more than 3 hours of compressed audio in the MP3 format. Once recorded, simply slip them in their color-matched ultra-slim case and carry them along wherever you go. Ultra-portable for convenience .</p>	185MB/32X
Inkjet CD-R	<p>Providing high-quality printing, on CD/DVD inkjet printers, Verbatim Glossy White Inkjet Printable discs are the ideal choice for full-color, true-to-life photo quality printing. Customize each disc with crisp text and full color graphics along with reliable high-speed recording.</p> <p>This inkjet printable surface has excellent ink absorption and durable, longer lasting colors. White Glossy Inkjet Printable discs have been extensively tested and qualified for use with DVD/CD Inkjet printers and duplicators offered by such leading industry manufacturers as Primera, Microboards & Epson. Full-color, high resolution, photo-quality printing . Fast Ink drying & Longer lasting colors. Superior ink absorption on high-resolution 5,760 DPI printers . Crisp & clear text reproduction .</p>	700MB/52X

Thermal CD-R	For sharp, clear graphics using color thermal printers. which supports full-surface edge-to-edge printing. Certified for use with color thermal printers including Rimage Everest technology, these 52x speed certified CD-R discs have a white, thermal, scratch resistant surface. This surface optimizes thermal printing for superb high-resolution reproduction of graphics text and logos. Ideal for CD duplicating. Super Azo” dye provides long-term data security and superior resistance to UV irradiation.	80MIN 700MB 52X
Silk-screening CD-R	Providing the ideal surface for silk-screening by duplicators, Verbatim’s Shiny Silver CD-R media also maintains high quality high-speed recording performance. Shiny Silver surface ideal for silk-screening .	700MB/52X
CD-RW		
2X-4X Speed	Verbatim CDRW utilizes an advanced super-eutectic phase change recording layer which ensures durability and reliability while archiving data at higher rewrite speeds. These discs allow you to rewrite data without errors up to 1,000 times. Certified 2X-4X speed rewrite compatibility. Read compatible with multi-read CD & DVD drives. Long archival life.	80MIN 700MB 2X-4X
Inkjet	With a silver inkjet printable surface qualified for high-resolution photo quality disc printing, Silver Inkjet Printable CD-RW discs provide exceptional printing and recording performance on CD/DVD inkjet printers and duplicators. These discs can be erased and rewritten to multiple times. Verbatim 2X-4X CDRW media is ideal for drag & drop recording using packet writing software such as DirectCD. Silver Inkjet Printable- full color, high-resolution photo quality printing (5,760 DPI Printers) . Silver surface provides luminescent background for vibrant rich colors. Qualified for use with CD/DVD inkjet printers from Primera, Microboards, Epson and others. Crisp & clear text reproduction . Certified 2X-4X speed rewrite compatibility	80MIN 700MB 2X-4X
CD-RW High Speed	Verbatim CDRW utilizes an advanced super-eutectic phase change recording layer which ensures durability and reliability while archiving data at higher rewrite speeds. These discs allow you to rewrite data without errors up to 1,000 times. Certified 4X-12X ultra speed rewrite compatibility. Rewritable up to 1,000 times. Read compatible with multi-read CD & DVD drives .	700MB 4X-12X

DVD Products (Digital Video Disc)

DVD is the next step up from the CD of optical disc storage technology. DVD is essentially a bigger, faster CD that can hold cinema-like video, better-than-CD audio, still photos, and computer data. DVD aims to encompass home entertainment, computers, and business information with a single digital format. The DVD products have a DVD-R and a DVD+R. This was initially because there were two platforms used by different companies using the DVDs.

It's important to understand the difference between the *physical formats* (such as DVD-ROM and DVD-R) and the *application formats* (such as DVD-Video and DVD-Audio). DVD-ROM is the base format that holds data. DVD-Video (often simply called DVD) defines how video programs such as movies are stored on disc and played in a DVD-Video player or a DVD computer. The difference is similar to that between CD-ROM and Audio CD. DVD-ROM includes recordable variations: DVD-R/RW, DVD-RAM, and DVD+R/RW. The application formats include DVD-Video, DVD-Video Recording (DVD-VR), DVD+RW Video Recording (DVD+VR), DVD-Audio Recording (DVD-AR), DVD Stream Recording (DVD-SR), DVD-Audio (DVD-A), and Super Audio CD (SACD). There are also special application formats for game consoles such as Sony PlayStation 2 and Microsoft Xbox.

Some of the features of a DVD are as follows:

- Over 2 hours of high-quality digital video (a double-sided, dual-layer disc can hold about 8 hours of high-quality video, or 30 hours of VHS quality video).
- Support for widescreen movies on standard or widescreen TVs (4:3 and 16:9 aspect ratios).
- Up to 8 tracks of digital audio (for multiple languages, commentaries, etc.), each with as many as 8 channels.
- Up to 32 subtitle/karaoke tracks.
- Automatic seamless branching of video (for multiple story lines or ratings on one disc).
- Up to 9 camera angles (different viewpoints can be selected during playback).
- On-screen menus and simple interactive features (for games, quizzes, etc.).
- Multilingual identifying text for title name, album name, song name, cast, crew, etc.
- Instant rewind and fast forward (no "be kind, rewind" stickers and threats on rental discs)
- Instant search to title, chapter, music track, and timecode.
- Durable (no wear from playing, only from physical damage).
- Not susceptible to magnetic fields. Resistant to heat.
- Compact size (easy to handle, store, and ship; players can be portable; replication is cheaper than tapes or laserdiscs).

Item	Description	
DVD+R	Offers 4.7GB or 120 Minutes of write-once storage capacity, superior recording quality, and compatibility with 1X to 16X DVD+R writers. The 16X cutting edge technology allows users to record a complete 4.7GB/120Min disc in approximately 5 minutes. Media is compatible with Sony, Dell, HP, Compaq and other leading drive manufacturers. Ideal for recording up to 2 hours of DVD quality home movies and video clips. Archive and back up, up to 4.7GB of important data.	4.7GB/16X
DVD+R DL	DVD+R Double Layer nearly doubles the storage capacity with two AZO recording layers on a single-sided disc. Verbatim discs are approved for high speed burning up to 6X speeds, saving you about 20 minutes per burn. Store up to 8.5GBs of video in approximately 16 minutes or less while maintaining compatibility with most DVD video players or DVD-ROM drives. Verbatim DVD+R DL discs burn up to 6X speed with compatible high speed DVD+R DL drives. Record 4 hours of DVD quality television and video (16 hours of VHS quality). Ideal for archiving home movies.	8.5GB/2.4X
DVD+R Lightscribe	LightScribe Direct Disc Labeling is a new technology that offers consumers a simple, no-hassle way to burn professional, silkscreen-quality labels on their DVDs. Using the same laser that burns data in their disc drives, customers burn their data as always, flip the disc over, reinsert it into the drive and burn a precise and permanent iridescent label. BURN music, digital photo albums, presentations and home movies directly on your DVD or CD. FLIP.... Inscribe/Burn your customized label. ALL with one laser...in one drive! Professional-quality labels: laser precision and detail means no more marker scrawl or adhesive labels to center, only to have them peel off the disc. Durability: the disc's image-ready coating is an integral part of its manufacture, providing long-lasting, scratch-resistant labels. Mobility: labels can be burned wherever and whenever a disc is burned, no need for a printer	4.7GB
Photo DVD+R	Photo DVD+R is the ideal storage solution for archiving digital images. To protect the recording layer, a Crystal coating has been applied to the label surface to prevent scratching that may occur during labeling or everyday handling.. Store over 8,500* of your favorite digital images on a Verbatim Photo DVD+R. *Based on typical image size of 500 KB. Image size will vary based on camera model and compression mode.	4.7GB/16X
DVD-R	Verbatim DVD-R offer 4.7GB or 120 Minutes of write-once storage capacity, superior recording quality, and compatibility with 1X to 16X DVD-R writers. Verbatim 16X DVD-R discs allows users to record a complete 4.7GB/120Min disc in approximately 5 minutes. Verbatim 16X DVD-R media is compatible with Pioneer, Toshiba, Hatachi, Apple, Sony, Panasonic and other leading drive manufacturers. Ideal for recording up to 2 hours of DVD quality home movies and video clips. Archive and back up, up to 4.7GB of important data	4.7GB/16X

DVD+RW	Verbatim DVD+RW offers 4.7GB or 120 Minutes of rewritable storage capacity, superior recording quality, and compatibility with 1X to 4X DVD+RW writers. Verbatim 4X DVD+RW is ideal for archiving or backing up 4.7GB of data or 120 minutes of DVD-quality video. Verbatim 4X DVD+RW media is compatible with most DVD-ROM drives as well as writers from Sony, Dell, HP, Compaq and other major DVD+R/+RW drive manufacturers. 1X-4X DVD+RW recording speed.	4.7GB/4X
DVD-RW	Compatible with Pioneer, Apple, Panasonic, Toshiba, Hatachi,	
Digital Movie DVD	DigitalMovie DVD media puts the fun in recording, viewing and sharing home movies. Available in DVD+R format, DigitalMovie DVDs are ideal for businesses that want their marketing videos to stand out and for videographers who want to create distinctive-looking discs for distribution , DigitalMovie DVDs are perfect for backing up DVD video titles and transferring video tapes to optical media that won't degrade over time. Unique "movie reel" disc surface. 1x-8X speed DVD+R discs.	4.7GB/8X
DVD Ram	<ul style="list-style-type: none"> • 4.7GB single-sided media in disc-removable Type 4 cartridge • 3X high speed recording & high capacity data transfer • Store 120min of high quality DVD video • Phase change recording technology • Provides high reliability & random access editing • Drag & drop storage just like a hard disk • Write/rewrite more than 100,000 times • Hard coating protects disc from scratches and fingerprints • Designed for data intensive, high performance applications • Compatible with DVD-RAM drives and video recorders from Panasonic, Toshiba, Hitachi, JVC, Samsung, and LG 	4.7GB/3X
DVD Qfix	Qflix™ DVD media. Qflix technology, licensed from Sonic Solutions?, allows movies and other video content to be downloaded and legally burned using recordable Content Scramble System (CSS) technology. Backed by Verbatim's decades-long reputation for delivering media with the highest-quality and broadest compatibility, the new product line will include both Qflix consumer media and printable Qflix Pro media for enterprise use.	

Blu-Ray Media

Blu-ray is supported by Sony/Phillips. Blu-ray, also known as Blu-ray Disc (BD), is the name of a next-generation optical disc format jointly developed by the Blu-ray Disc Association (BDA), a group of the world's leading consumer electronics, personal computer and media manufacturers (including Apple, Dell, Hitachi, HP, JVC, LG, Mitsubishi, Panasonic, Pioneer, Philips, Samsung, Sharp, Sony, TDK and Thomson). The format was developed to enable recording, rewriting and playback of high-definition video (HD), as well as storing large amounts of data. The format offers more than five times the storage capacity of traditional DVDs and can hold up to 25GB on a single-layer disc and 50GB on a dual-layer disc. This extra capacity combined with the use of advanced video and audio codes will offer consumers an unprecedented HD experience.

While current optical disc technologies such as DVD, DVD±R, DVD±RW, and DVD-RAM rely on a red laser to read and write data, the new format uses a blue-violet laser instead, hence the name Blu-ray. Despite the different type of lasers used, Blu-ray products can easily be made backwards compatible with CDs and DVDs through the use of a BD/DVD/CD compatible optical pickup unit. The benefit of using a blue-violet laser (405nm) is that it has a shorter wavelength than a red laser (650nm), which makes it possible to focus the laser spot with even greater precision. This allows data to be packed more tightly and stored in less space, so it's possible to fit more data on the disc even though it's the same size as a CD/DVD. This together with the change of numerical aperture to 0.85 is what enables Blu-ray Discs to hold 25GB/50GB. Blu-ray is more expensive to produce but it holds more than HD DVD.

HD DVD-R

HD DVD is supported by Toshiba. Using much of the same technology as Blu-Ray, Toshiba began the HD revolution. Companies such as Dreamworks and Microsoft have contracted with Toshiba which will only allow their movies or discs to be released on HD. Even though Apple sits on the Blu-ray Board of Directors, its DVD Studio Pro software supports authoring HD DVD media. The Nichi Corporation, who holds the design patents to the Blu-ray's laser system, sits as an associate member of the HD DVD Promotion Group.

A good resource to learn more of what CDs and DVDs can do is to go to <http://dvddemystified.com>. Go to the DVD FAQ section. Or, just Google it – you will find more information than you will know what to do with.