



SECONDARY STORAGE DEVICES



Secondary storage devices

- Since Primary storage has a limited storage and is not permanent ,We use secondary storage devices.
- Secondary storage devices are used to store large amount of data Permanently.



Types of Secondary storage devices

Types include:

- Hard disks.
- Floppy disks.
- CD ROMs.
- DVDs.
- Pen drives.
- Blue Ray Disks.



Floppy Disks



Floppy Disks-History

- The first floppy disks were 8 Inches in diameter.They hold upto 256 KB.
- The next generation were 5.25 inches in diameter.It Could hold up to 1.44 MB.It is a standard one.
- The next generation were 3.5 inches in diameter.
 - These disks are held within a hard plastic case
 - A spring loaded flap protects the disk from dust and greasy fingers.
 - Could hold up to 2.88 MB



Floppy Disks(Diskette)

- It is one of the oldest type of portable storage devices still in use.
- It is used to transfer small files between computers.
- It is also used to store data as backup.
- Floppy disks are made of a flexible substances called Mylar.
- A standard floppy disk can store 1.44Mb of data(300 A4 pages).



Floppy Disks(Diskette)

- The Floppy disks can take more space for graphics/pictures than texts.
- All disks are formatted before data can be written to disks.

Formatting:

- *Formatting means Marking and dividing the disk into tracks and sectors.*
- *Disks are divided into concentric circles called tracks.*
- *Each track is subdivided into sectors.*

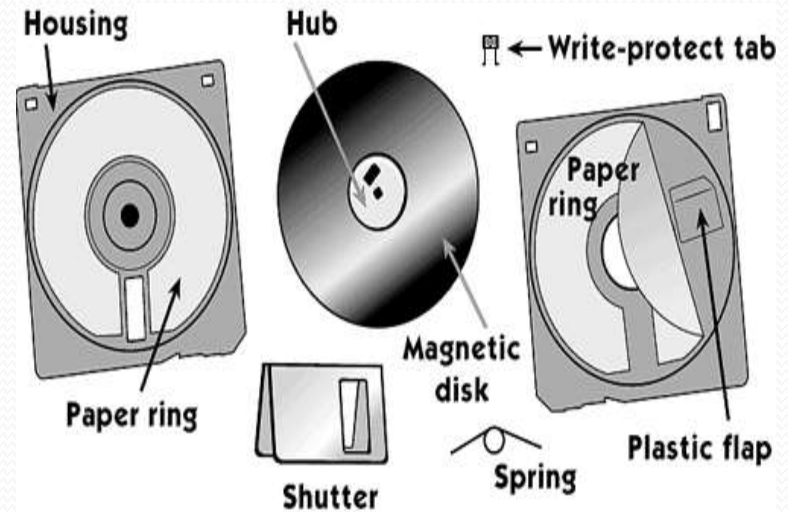


Floppy disks



Floppy Disks (Diskette)

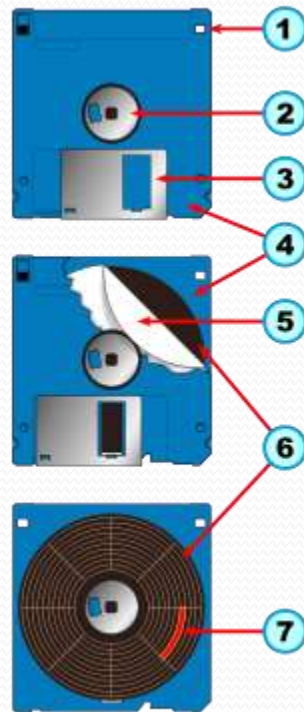
Parts of disks



- Read write head in the disks



Internal parts of floppy disk.



- ***Internal parts of a 3 1/2-inch floppy disk.***
 - 1) A hole that indicates a high-capacity disk.
 - 2) The hub that engages with the drive motor.
 - 3) A shutter that protects the surface when removed from the drive.
 - 4) The plastic housing.
 - 5) A polyester sheet reducing friction against the disk media as it rotates within the housing.
 - 6) The magnetic coated plastic disk.
 - 7) A schematic representation of one sector of data on the disk; the tracks and sectors are not visible on actual disks.

Hard Disks



Hard Disks

- A **hard disk drive (HDD)** is a data storage device used for storing and retrieving digital information using rapidly rotating discs (platter) coated with magnetic material.
- A HDD memories store information on one or more *circular platters* which are continually spinning.
- Information is recorded on the surface of rotating data by *magnetic heads* as tiny magnetic spots.
- These heads are mounted on arms.

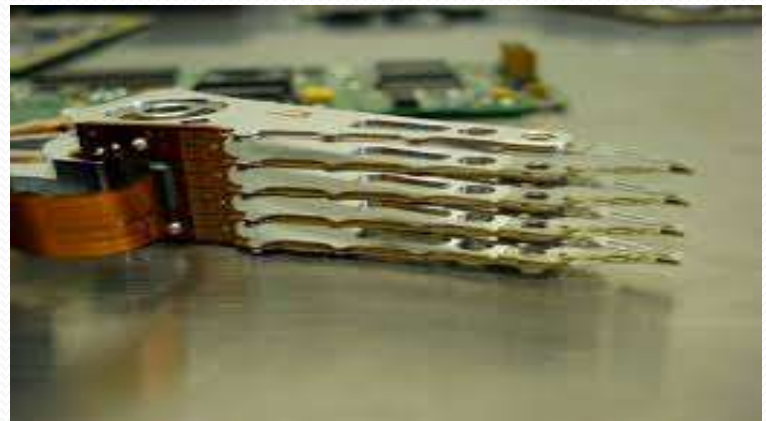


Hard Disks

- Information is recorded in bands.
- Each band of information in a given disk is called a *track*.
- The tracks are commonly subdivided into pie-shaped sections called *sectors*.
- A motor rotates the disk at a rapid speed.
- Data are recorded on the tracks and read by using read/write heads.



Hard Disks



CD-ROMs



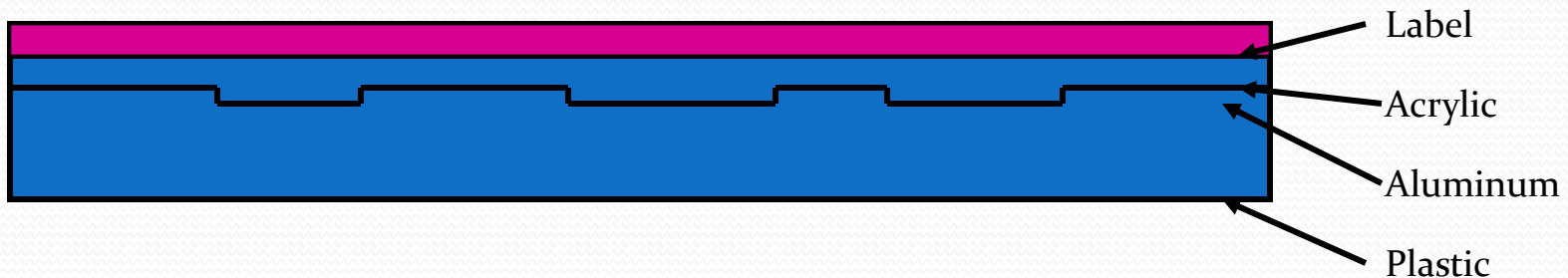
Compact Discs

- The Compact Disc or CDs are optical media.
- The CDs are relatively cheap and have a storage capacity of up to 700Mb.
- The Compact Disc-Read Only Memory:
This is used only to store information ,not to store data.
- Manufacturers use CD-ROMs to record information including text ,graphics or audio on CD distribution.



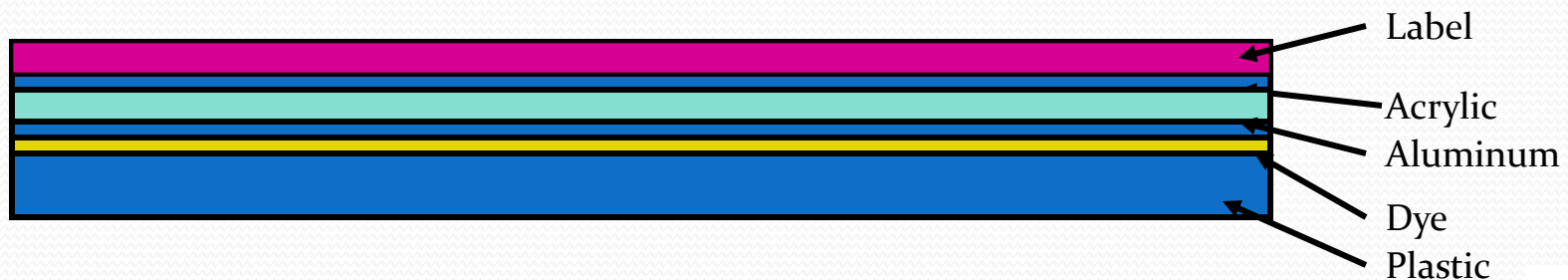
CD-ROMs

- CD Roms use the same technology as audio Compact Discs.
 - A master disc is created.
 - Copies of the disc are created through a pressing process
 - The discs are aluminum sandwiched between plastic
 - CDs are single sided.



CD-R(Recordable)

- Datas are recorded on these discs only once.
- The CD-Rs allow you to write on one part of the disc on one time another part at a later time.
- Each part of CD-Rs allow you to write on only once and can't be erased.



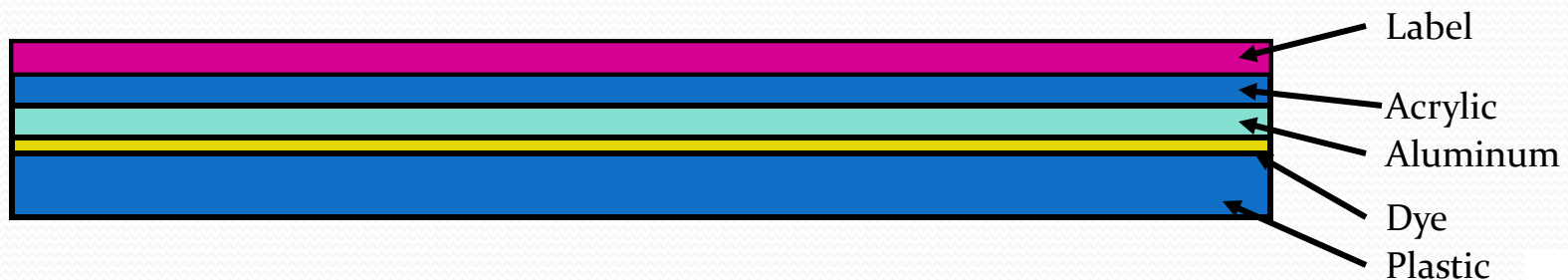
CD-R(Recordable)

- CD Rs are made out of aluminum and plastic, but also contain a dye layer
- This dye is modified by a laser when the disc is being written.
- The laser heats up the dye and it becomes non-reflective.



CD-RW(Rewritable)

- The CD-RW is an erasable disc.
- We can write it on multiple times like floppy or hard disks.
- This is the main advantage in this.
- Too much of erasing fades the dye.



DVDs



DVDs

- DVD is an optical storage device that looks like the same as a CD.
- But, it is able to hold about 15 times as much information and transfer it to the computer about 20 times as fast as CD-ROMs.
- Also called *super density disk*.
- It can hold 17 gigabytes of data.



DVD-ROM

- The DVD-ROM is high capacity optical disc capable of storing 4.7 GB to 17GB.
- DVDs were originally developed for the movie industry.
- It can read audio CDs, CD-ROMs, CD-Rs, CD-RWs



DVD-R

- It is similar to CD-Rs which allows user to write on the disc once but read it many times.
- Dye layer is used for data writing.



DVD-RW

- Most writable DVD drives are DVD-RW.
- We can erase and read many times on them.
- DVD -R and DVD-RW have two additional formats which are + and -.



Pen Drives



Pen-Drive

- A pen drive, or a USB flash drive, is a portable data-storage device.
- Pen drives have replaced the floppy drives of old and have become the most popular data-storage devices among consumers.
- Micro, lightweight and handy, a pen drive can be easily carried from place to place by students, professionals, academicians and independent tech consultants

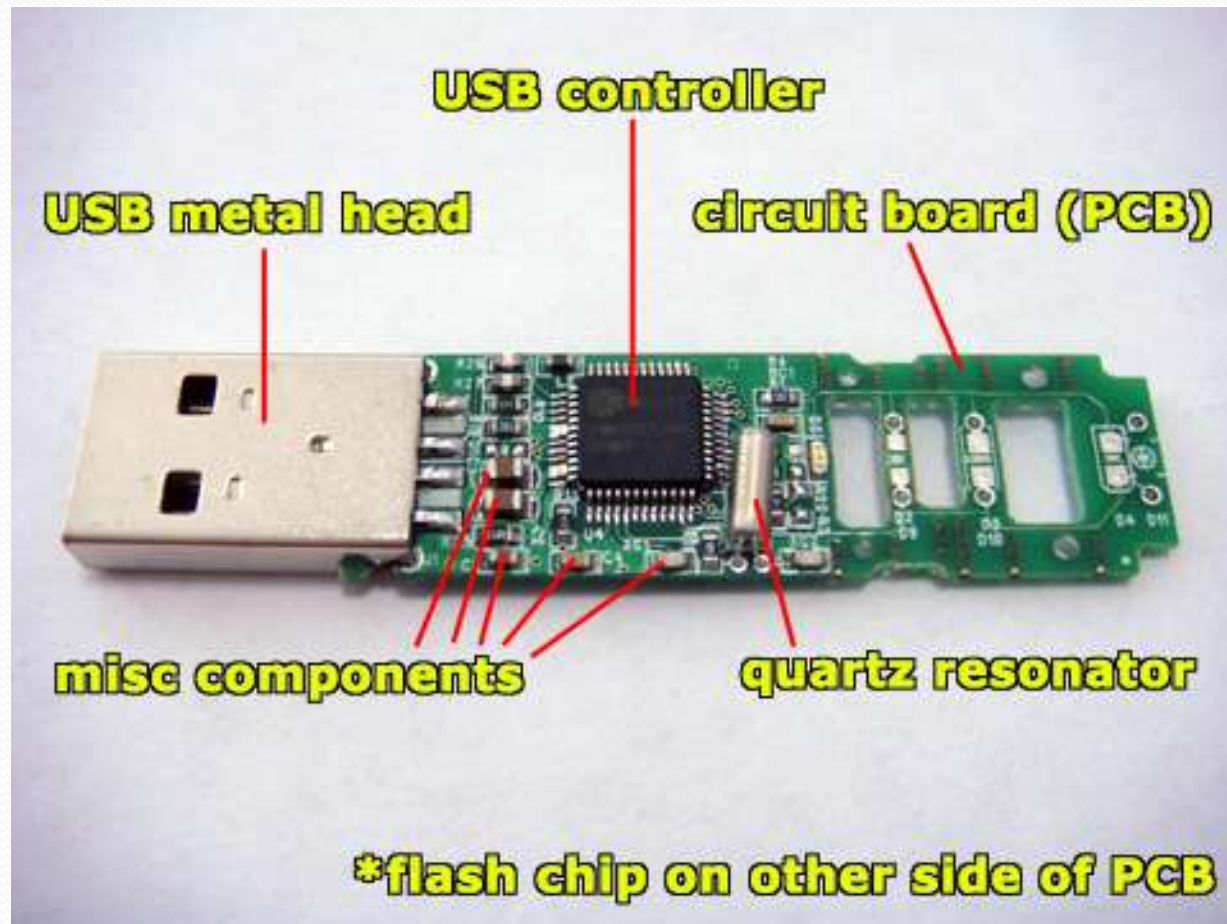


Pen-Drive

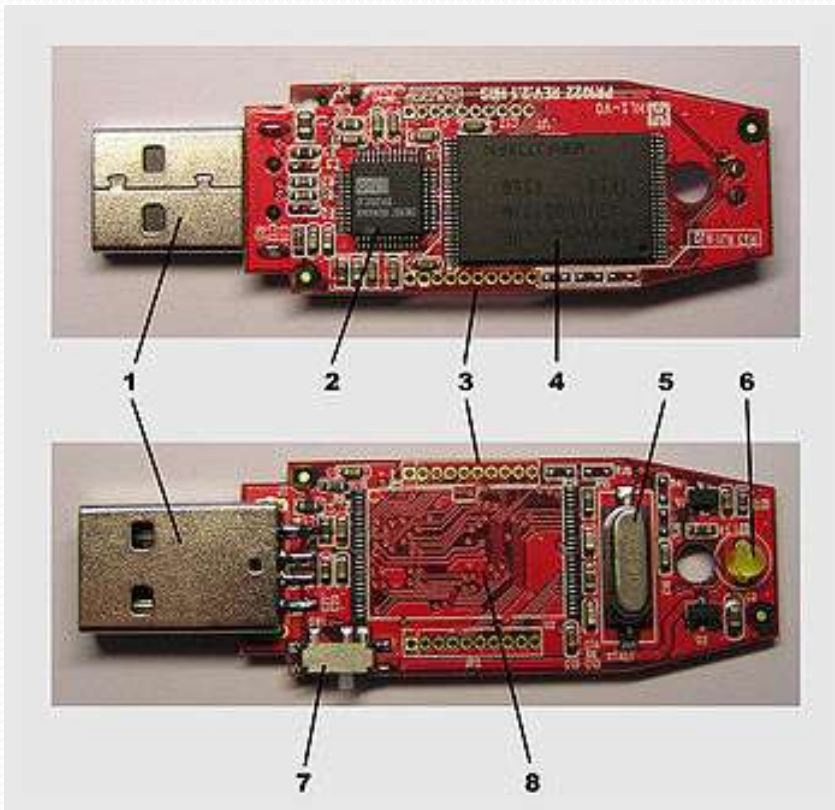
- Currently available pen drives with storage capacities ranging from 4GB and 32GB can be used to store graphics-heavy documents, photos, music files and video clips.



Pen-Drive



Design and implementation



- 1.USB standard male-A plug
- 2.USB mass storage control device.
- 3.Test points.
- 4.Flash memory chip.
- 5.Crystal oscillator
- 6.LED(optional).
- 7.Write protect switch(option).
- 8.Space for second flash memory.

Advantages Of Pen Drive

- Resistant to scratches, dust and magnetic fields.
- Consumes less power compared to other devices.
- Pen Drives are Universal
- Small Size for Easy Transport
- Affordability



Disadvantages of pen drives

- Due it's small size, pen drives can be easily misplaced or lost.
- Improperly wired USB ports can destroy the circuitry of pen drives.
- Virus attack.



Pen drive Models



Blu Ray Disc



Blu-Ray Disc

- **Blu-ray Disc (BD)** is an *Optical disc storage medium* designed to supersede the DVD format.
- The plastic disc is 120 mm in diameter and 1.2 mm thick, the same size as DVDs and CDs.
- Developed by blu-ray disc association (which includes Apple, Hitachi, HP, LG, Panasonic, Pioneer, Philips, Samsung, Sharp, Sony).
- Wavelength of laser which reads data: **405 nm**



Blu-Ray Disc-Name

- The blu-ray name is a combination of “blue”, for the color of the laser that is used and “ray” for optical ray.
- The “e” in “blue” was purposefully left off, according to the manufacturers, because an everyday word cannot be a trademark.



Blu-Ray Disc -Formats

- It comes in four different formats:
 - BD-ROM (read only) : for reading recorded content.
 - BD-R (recordable) : for PC data storage.
 - BD-RW (rewritable) : for PC data storage.
 - BD-RE (rewritable) : for HDTV (high definition television) recording.



Types Of Blu-Ray Disc

➤ SINGLE LAYER:

- Can hold data up to 25/27 GB that means 2 hrs of HD video or about 13 hrs of standard video.

➤ DOUBLE LAYER:

- Can hold data up to 50 GB that means 4.5 hrs of HD video or more than 20 hrs of standard video.



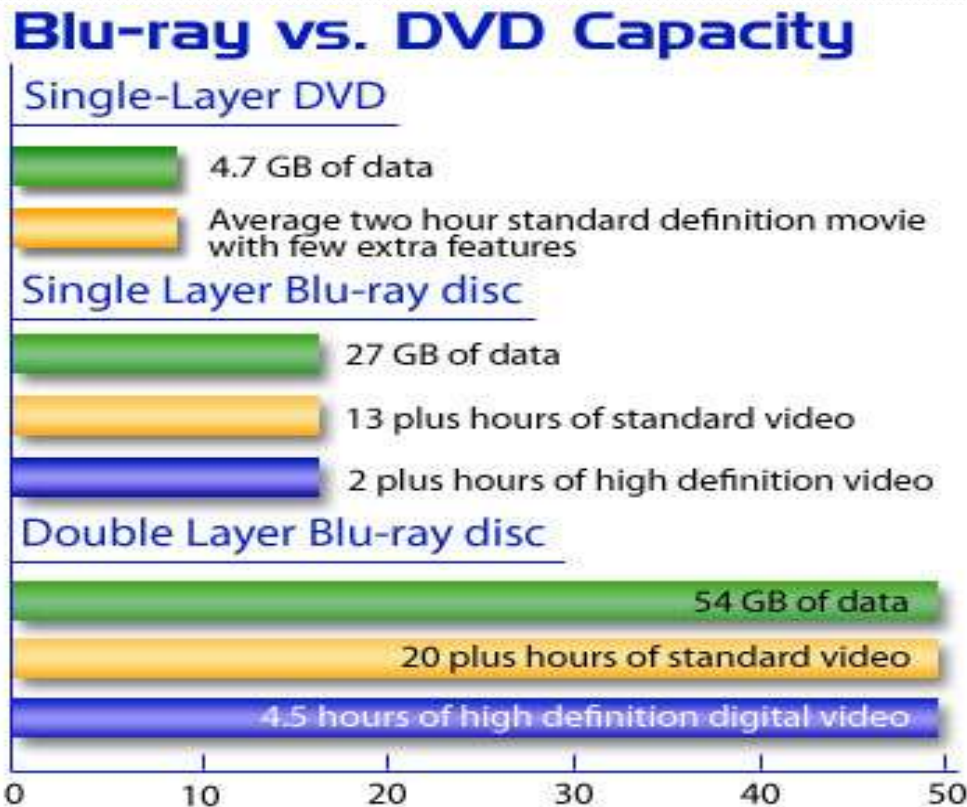
FEATURES of BD

With BD we can:

- Record HDTV without any quality loss
- Instantly skip to any spot on disc.
- Record one program while watching other on the disc
- Create playlists
- Edit or reorder programs recorded on disc
- Automatically search for an empty space on the disc to avoid recording over a program
- Access to web to download subtitles and other extra features
- And many more...

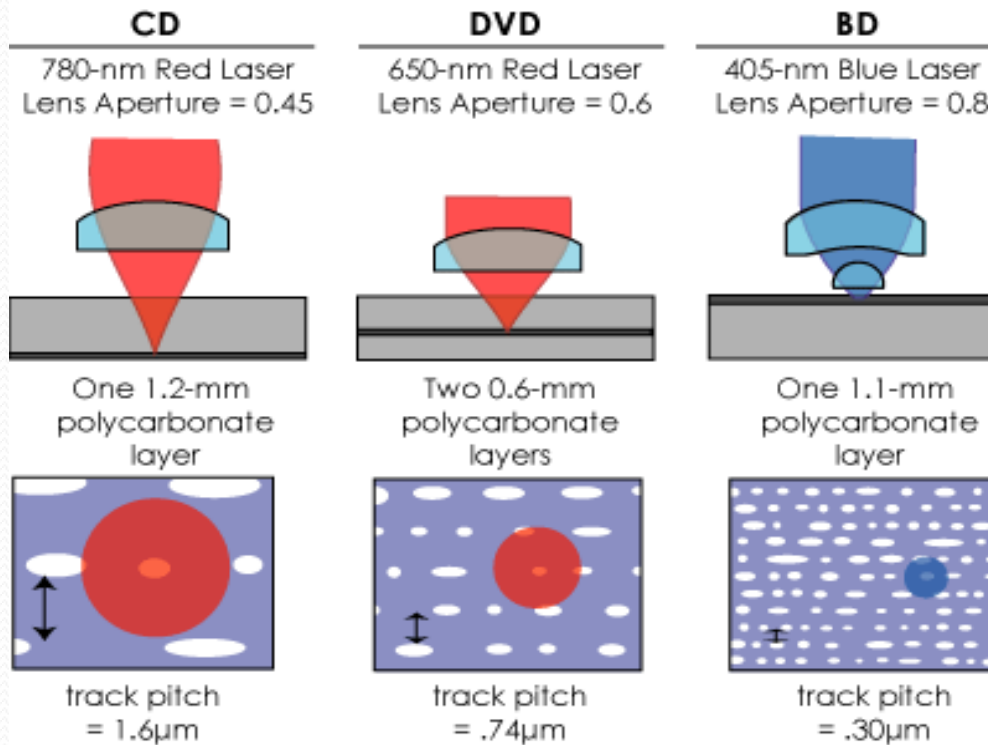


Blu-Ray Vs DVD



CD Vs DVD Vs Blu-Ray Disc

CD vs. DVD vs. Blu-ray Writing



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Blu-Ray Disc Products

Current BD Products



BD Products Already Released



**Panasonic
E700BD**



Sony BDZ-S77



Sharp BD-HD100



**Samsung
BDR1000**



LGE LGXBG420



**Panasonic
LM-BRM50/25**



Sony BF-23G



TDK BD-RE120N



Philips (CEATEC '04)



Pioneer (CEATEC '04)



JVC (CEATEC '03)



Mitsubishi (CEATEC '04)





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