

Compact Disc

A Compact Disc (CD) is an optical disc used to store digital data. CD-ROMs and CD-Rs remain widely used technologies in the computer industry. CD-ROM drives employ a near-infrared 780 nm laser diode. The laser beam is directed onto the disc via an opto-electronic tracking module, which then detects whether the beam has been reflected or scattered.

A CD is made from 1.2 mm thick, almost-pure polycarbonate plastic and weighs 15–20 grams. From the center outward components are at the center (spindle) hole, the first-transition area (clamping ring), the clamping area (stacking ring), the second-transition area (mirror band), the information (data) area, and the rim. Standard CDs have a diameter of 120 mm and can hold up to 80 minutes of uncompressed audio (700 MB of data). The Mini CD has various diameters ranging from 60 to 80 mm; they are sometimes used for CD singles or device drivers, storing up to 24 minutes of audio.

What makes a CD?

A CD is made up of a polycarbonate plastic known as Polymethyle Meta acrylic. The surface of the CD is coated with a thin layer of aluminium to make it reflective, and is protected by a film of lacquer that is normally spin coated directly on top of the reflective layer, upon which the label print is applied.

Data Storage

CD data are stored as a series of tiny indentations known as "pits", encoded in a spiral track molded into the top of the polycarbonate layer. The areas between pits are known as "lands". Each pit is approximately 100 nm deep by 500 nm wide, and varies from 850 nm to 3.5 μm in length. CD-ROM capacities are normally expressed with binary prefixes, subtracting the space used for error correction data. A standard 120 mm, 700 MB CD-ROM can actually hold about 737 M. In comparison, a single-layer DVD-ROM can hold 4.7 GB of error-protected data.

CD parameters

- Scanning velocity: 1.2–1.4 m/s (constant linear velocity) – equivalent to approximately 500 rpm at the inside of the disc, and approximately 200 rpm at the outside edge. (A disc played from beginning to end slows down during playback.)
- Track pitch: 1.6 μm
- Disc diameter 120 mm
- Disc thickness: 1.2 mm
- Inner radius program area: 25 mm
- Outer radius program area: 58 mm
- Center spindle hole diameter: 15 mm

Electroskan Designs