

Multiple Data Layer Formats

One of the major innovations in the DVD format is the use of two polycarbonate substrates, each half the thickness of a standard CD, bonded back to back. This has several technical advantages.

It is possible for a given wavelength of playback laser to distinguish smaller pits if they are played back through a thinner layer of polycarbonate. It is possible to double the capacity of the disc, if the user is prepared to turn it over. The two substrates will both tend to warp slightly, but will do so in opposite directions, cancelling each other out and resulting in a flatter disc.

The most complex application of multiple layers in the DVD format is dual-layer discs such as DVD-9 and DVD-18, in which the player can read one layer then refocus the laser to read a second layer through the first one, without turning the disc over. The principle of this is relatively simple. The reflective metal layer on the layer of data nearest the pickup is thin enough to be partially transparent, referred to as semi-reflective. An appropriately designed pickup can then choose whether to focus on the first layer (layer 0) or the second layer (layer 1) of data. The application of this from a mastering and manufacturing point of view is more complex.