CD ROM

For your Business – 2

We feel it is important for clients to understand the time consuming, complex process of making their CD and the quality control measures that insure it will work, and work every time. Therefore we present this information for you as an education and a valuable reference.

HOW COMPACT DISCS ARE MADE:

We get material in many forms at our facility. If it is material ready to use, then it is “Image ready”, or if it needs to be converted, it is “Non-image ready”. Non-image means that it needs to be converted or pre-mastered into an image ready form for programming.

Remember that PS/A provides complete video, audio and graphics services in order to insure that your CD ROM project is complete and efficiently designed.

Image ready usually arrives on a CD-R (one-off, gold master) or if it is Non-image ready, it arrives in a variety of mediums including video and audio tapes, flat art, pictures, text files or written material. Once this material is pre-mastered, it may be sent to the customer on a CD-R to check its acceptability and gain your approval. Once approved, it is ready to be mastered.

Glass Prep and Mastering:

The first part of mastering involves the preparation of a glass substrate. The glass substrate is a round disc of polished glass. After cleaning and polishing, a liquid layer of material call photoresist is spin coated evenly into the glass. The glass substrate with the photoresist is then baked for about an hour. The glass substrate with the dried photoresist is called a glass master. The glass master is then placed into a laser beam recorder that is connected to a computer. The data image source (CD-R) is loaded into the computer. The data image is then read from the computer and recorded to the photoresist on the glass master using the laser. The data is recorded from the center of the glass master in a spiral track that goes toward the outside of the glass master. After recording, the glass master is developed by spinning a Sodium Hydroxide solution over the glass master.

Wherever the laser touched during the recording, the photoresist washes away leaving a tiny pit of information. The developed glass master, coated with silver, is called a metalized glass master. This metalized glass master is then sent on to Electroforming.

Electroforming:

The metalized glass master is placed into a tank of Nickel Sulphamate solution for about two hours. During this time, a layer of Nickel is grown onto the silver surface of the metalized glass master. When finished, the metalized glass master is removed from the tank and the Nickel is separated from the Silver. This sheet of Nickel is called the "father". The father is a reverse image of the data and could be used to stamp discs. However, the father is not normally used to stamp discs, since if it were damaged, the whole process to create it would have to begin again. Therefore, the father is placed back into the electroforming solution for another two hours and a new layer of Nickel is grown. The elctroformed father is removed from the tank and the new layer of Nickel is removed from the father as it was the first time. This new layer is now called the "mother".

The mother is then returned to the tank for about two hours and another layer of Nickel is grown. This layer of Nickel is removed from the mother and is called the "stamper". The stamper is a reverse image of the original data, like the father, and therefore can be used to create discs. Several stampers can be grown from a mother to speed the duplication process.

Stamper Finishing:

The stamper is finished by punching out the center hole and outer edge and polishing its backside to be perfectly smooth. The stamper is now ready to be loaded into an injection molding machine to make discs.

Injection Molding:

The stamper is placed into an injection molding machine. The injection machine is connected to a continuous supply of Polycarbonate. The Polycarbonate is heated to a molten state and shot into a mold that contains the stamper. The plastic is compressed against the mold under several tons of pressure. The plastic is then cooled using chilled water and the clear disc with the information stamped into it is removed. The whole process to stamp a disc takes about 5 -10 seconds, depending on the speed of the molding machine.

After being stamped, a thin layer of Aluminum is sputtered onto the side of the disc that contains the pits or information. This thin layer of Aluminum is the reflective surface that the playback laser reflects off of to read the information. This process of putting Aluminum onto the disc is called metalization. After metalization, a thin layer of sealant or lacquer is spin coated onto the Aluminum. This sealant is dried or cured using ultraviolet light. The disc is now sealed and ready to be printed.

Printing:

Most CD's are screen printed with anywhere from 1 – 5 different colors. Each separate color requires it's own film and screen and is printed one at a time. The screen allows ink to pass through in the shape of the desired image. Ink is pressed through the screen and put onto the protective layer of the disc. The ink is the dried or cured using ultraviolet light. This process is repeated until all the colors have been printed. Be sure to allow for the center hole, the stacking ring and the matrix band when designing your artwork. Or, we will plan all of that for you if we are creating your artwork for the CD.

4 Color Packaging:

Try our complete in house state of the art specialty printing services. From design to finished product, our designers and producers will help you to create a clean and useful package for your CD mailers, CD wallets, CD tray cards or jewel cases. We are also capable of providing additional collateral materials for your marketing program.

Quality Assurance:

Throughout the production and manufacturing process, several different quality assurance tests and procedures are used. The success of your project is most important to us and we communicate thoroughly to involve you in the process. The basic tests used are the DVS test and signal verification tests. The DVS test is a bit for bit comparison between your original image ready data and a replicated disc. This test insures that the replicated discs are identical to your original material. Signal verification tests insure that the discs' playback parameters are within specifications.

Again, it is our goal to help you through this process and while the information here may be technical in nature, we want you to understand the steps we go through to insure your material is programmed and replicated to the highest standards.

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This file: CD ROM Info 2

Also see: CD ROM Info 1