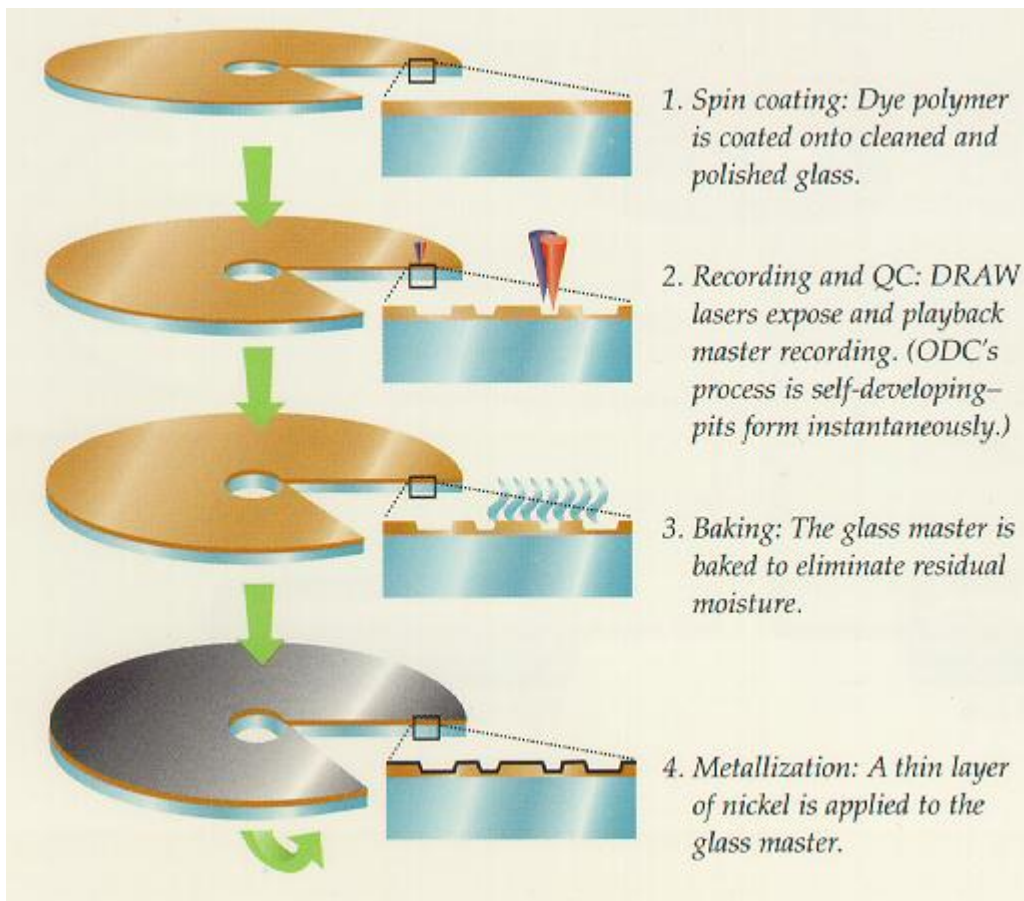


A GUIDE TO STAMPER MAKING

The manufacturing of optical discs can be viewed as two separate operations. The first operation is stamper making, which includes mastering and electroforming (galvanics). The second operation is replication, which includes utilizing the stamper for injection molding, finishing, and printing the replica. The steps to produce an ODC stamper are as follows:

ODC Mastering Steps:

There are several steps to producing a high quality stamper for CD or DVD production. First, the pre-mastered source material is loaded into the laser beam recorder, where it is formatted and then mastered. With ODC's Laser Wave LBR, a blue laser writes the data by forming pits onto the surface of a dye polymer coated glass substrate. A red laser immediately follows to read what was written, generate real-time quality control feedback, and adjust laser power and focus servos that continuously optimize pit geometry. The finished glass master is baked to remove residual moisture and then metallized with a thin layer of nickel to prepare the master for electroforming. After passing a visual inspection it is sent to electroforming.



Electroforming Steps:

During electroforming, nickel is plated onto the glass master. The nickel plate and the glass substrate are then separated to create a negative impression known as a "father." The father can be used as a stamper to mold discs or to make a galvanic family. A galvanic family is produced when more than one stamper is required from a single master. Galvanic families are produced by electroforming positive impressions from the father, known as "mothers." The mother is then used to create multiple copies referred to as "sons" or "stampers."

