

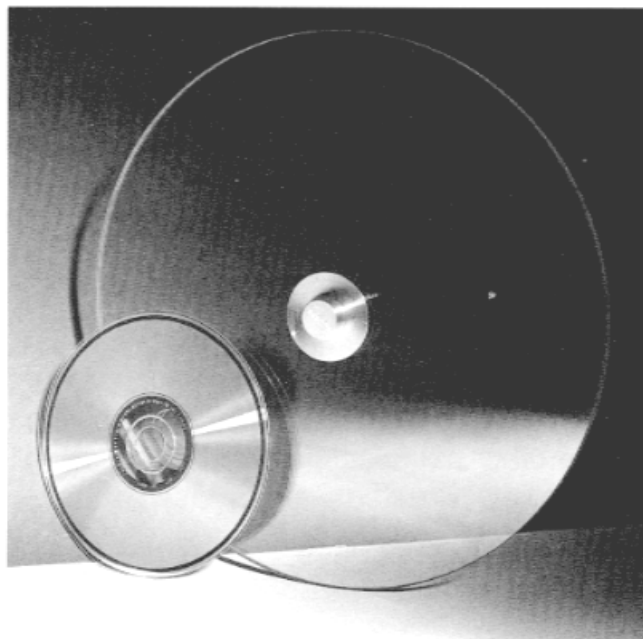
Cleaning Compact Disc Masters

Ultrasonic cleaning technology brings substantial savings to the compact disc recording industry by enabling the reuse of the six-millimeter thick glass master disc upon which the musical information is laser etched. Previously, these master discs were disposed after a single use because critical cleaning could not be achieved. Ultrasonic cleaning lowers the production cost of compact discs, an important factor to the future growth of the CD market.

CD Fabrication Process:

The heavy glass substrate, approximately a foot in diameter, receives an ultrathin layer of adhesive and a photoresist coating. It is then exposed to a laser beam which cuts microscopic pits into the photoresist, forming the code to be interpreted into music on a CD player. Because the pits are microscopic, even a single dust particle – large by comparison – can disrupt the recording, so cleaning is critical. The glass master then is immersed in a chemical solution that etches away areas exposed to the laser light and silver is thin deposited over the etched photoresist.

A metal master, or stamper, is obtained from the glass master and the glass is no longer needed for the remainder of the manufacturing process. Using the stamper, the individual discs are injection molded, cooled, and

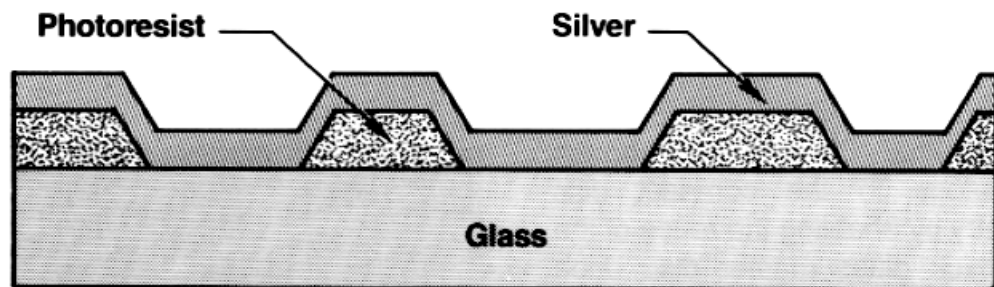


then covered with a thin protective coating. Labels are silkscreened and the disc is packaged for market.

Challenge:

Refurbish compact disc glass masters for reuse in the sensitive CD mastering process. Critical cleaning must be achieved without even the slightest marring of the glass substrate.

Compact Disc Master



Contaminants To Be Removed:

Silver, photoresist and adhesive layers must be removed from the glass master completely, as well as routine fingerprints, dust, and other manufacturing soils. The cleanliness level is determined by laser.

Former Cleaning Method:

None.

Ultrasonic System:

A multi-step aqueous process followed by solvent drying achieves critical cleanliness of the glass discs. The cleaning and rinsing tanks are mounted in a Branson stainless steel wet bench and the drying is performed within an adjacent Branson solvent dryer. The process is automated with a Branson TDR Two-Dimensional Robot handling system.

The cleaning steps are:

- Immersion in a heated ultrasonic bath using an acidic solution
- Overflow rinse

- Deionized water spray
- Three-stage cascade rinse using heated deionized water and ultrasonics in the middle stage
- HEPA-filtered hot air recirculating dryer.

Advantages:

- Provides a high-performance cleaning system where none previously existed.
- Allows exact process control and reduced labor costs through automation.
- Achieves critical cleaning of glass detail without damaging substrate
- Reduces expense of purchasing new CD glass masters for each recording.
- Alleviates dependency on glass manufacturer for master discs.
- Contains mastering process completely in-house.
- Pays back initial equipment cost in less than one month.

For application assistance, contact your nearest Branson office or Branson's Cleaning Applications Laboratory at (203) 796-0522.



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