

Photoresist

Photoresist is a chemical sensitive to light within a specific range of wavelengths. When exposed to light within that range, the photoresist undergoes a chemical change.

During optical disc mastering, a glass substrate coated in photoresist is selectively exposed by the mastering laser. After exposure, the glass is submerged in a developing solution. Both positive and negative photoresists are available, the difference being that the developing solution attacks the exposed areas of a positive photoresist and the unexposed areas of a negative photoresist.

The photoresist which remains on the substrate after developing is a physical template of the structure of the disc.

NTE's standard photoresist is Shipley 1800 series, a positive photoresist. In this case, the rate at which the developer attacks the photoresist increases with the intensity of exposure to the laser and is therefore greatest at the centre of the laser spot. The pit develops first as an increasingly deep depression until the surface of the glass is reached. After that time, the edges of the pit recede and become steeper. Thus it is possible to use the combination of laser intensity during mastering and the developing time to control the width of the pit and the angle of the edge slope.

The NTE mastering system controls the depth of the pit by carefully controlling the thickness of the photoresist coating on the glass substrate and developing exposed pits through to the glass.