

1975

Establishment of automatic dicing using a thin grinding wheel

~ Packaging ~

Daiichi-Seito (now Disco) exhibited a dicer at SEMICON WEST in 1975. The separation of IC chips on a wafer was done at that time by a scribe method, in which scribe lines were made on four sides of the chip by pressing a diamond blade, and the chips are broken and separated along these lines. The newly developed machine adopted a method of cutting the wafer by a thin diamond circular blade with a thickness of about $40\ \mu\text{m}$, rotating it while flowing pure water. It was a breakthrough machine.

When applying this dicer to MOSIC, Hitachi engineers found that electrostatic breakdown occurred by the collision of pure water molecules during the dicing operation, and that it was solved by adding CO_2 , thus lowering the resistivity of water.

Dicing tape and tape pasting device were developed by Nitto Denko in order to prevent the cut IC from scattering when dicing.

The development of this dicing technology improvement was achieved by the cooperative works of three companies, Disco, Nitto Denko and Hitachi. At the time of dicing, not cutting the whole by dicing but cutting to a thickness of about half, and separating the chips by pushing up a pin from the back side in the die bonding process is one, and the development of dicing tape which loses its adhesiveness by irradiating ultraviolet light so that chips can be easily peeled off from the tape is another.

Later, the thickness of the disk grindstone became thinner, the diameter of the wafer to be handled became larger, and a bevel cutter using two grinding stones were developed, but the basic method had been established at this time.

