



# STEVEN SEPVEST CORP

INDUSTRIAL LASER SOLUTIONS PROVIDER

## Wafer Industry

- **Overview**

Definition: Wafer dicing is the absolutely necessary working procedure in semiconductor chip manufacturing and it is the latter procedure. Wafer dicing is to divide the whole complete wafer chip into several single grains. Now, we have the technological capability to dice table diode, diamond SCR wafer and trigger tube wafer produced by GPP (Glass Passivation Process). Compared with traditional dicing process, it has so many advantages that many domestic factories have been producing GPP wafer and the finished products with this technology.

### **Existing Problems:**

- The blade works on wafer surface directly and lead to damage easily at the same time;
- The thick blade causes a larger line width of cutter;
- Increasing supply. The blade needed to be changed semimonthly;
- Cause serious environmental pollution because of the unwieldy silicon fume.

To meet demands for high product quality, a lot of factories are persistently seeking for new technology to promote work efficiency, so as to provide higher quality products to customers.

- **Our Solution**

There are two cutting technology in wafer dicing industry. One is traditional blade cutting; the other is modern laser dicing. I will prove the advantages of laser dicing by comparison.

### **Blade Cutting**

At first, wafer was cut by dicing system. This method is still popular in chip cutting market, especially the non-integrated circuit wafer dicing. Diamond saw blade is a common dicing method.

### **Principle**

When the work piece is hard and brittle, diamond will fracture and break it, then remove the powder with blade.

### **Laser Dicing**



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Owing to the advantages of focus, the focus point can be as small as submicron. It can undertake the processing of small part, especially the micro processing of wafer. It can get a higher energy density to process materials effectively, even without high pulse energy.

- Laser dicing can avoid chip broken and other damage phenomena without any contact;
- With high beam quality, the fiber laser has less effect on electric property of chips;
- The speed of laser dicing reaches as high as 150mm/s;
- With better versatility and compatibility, laser can work on wafers of various thicknesses;
- Laser can cut complicated wafers, such as the core of hexagon tub;
- Laser dicing can conduct 24 hours continuous working without deionized water and won't cause tool wears.

Dicing Equipment	Traditional cutting (abrasive wheel)	Laser dicing(optics)
Cutting Speed	5-8mm/s	1-150mm/s
Cutting Line Width	30~40 mu	30~45 mu
Cutting Effect	Easy to break and collapse	Smooth, flat and firm
Heat Affected Zone	Larger	Smaller
Residual Stress	Larger	Smaller
Wafer Thickness Requirements	More than 100 um	Almost no requirement
Adaptability	Change cutter with different wafer chips	Adapted to different wafer chips
Loss	Need deionized water Need to change blade Loss is great	Loss is very small

### • Customer Benefit

With laser technology, customers will benefit much:

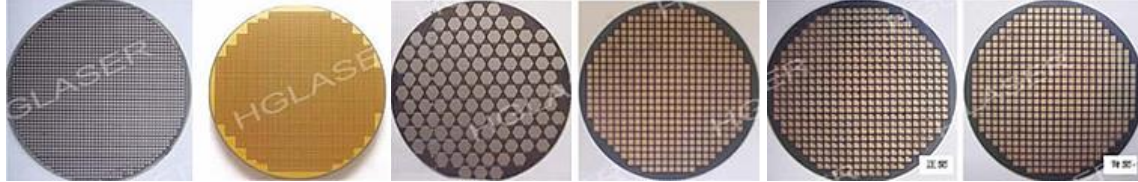
- Avoid chip broken and other damage phenomena without any contact;
- High-quality laser beam improves product yield rate;
- Fast speed as high as 150mm/s;
- Better versatility and compatibility, can work on various thicknesses;
- Can cut complicated wafers;
- No tool wear, can conduct 24 hours continuous working.



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- **Related Application**



Diode GPP Wafer Trigger Tube GPP

Hexagon GPP Wafer Discharge Tube

Double Table Diamond SCR Wafer