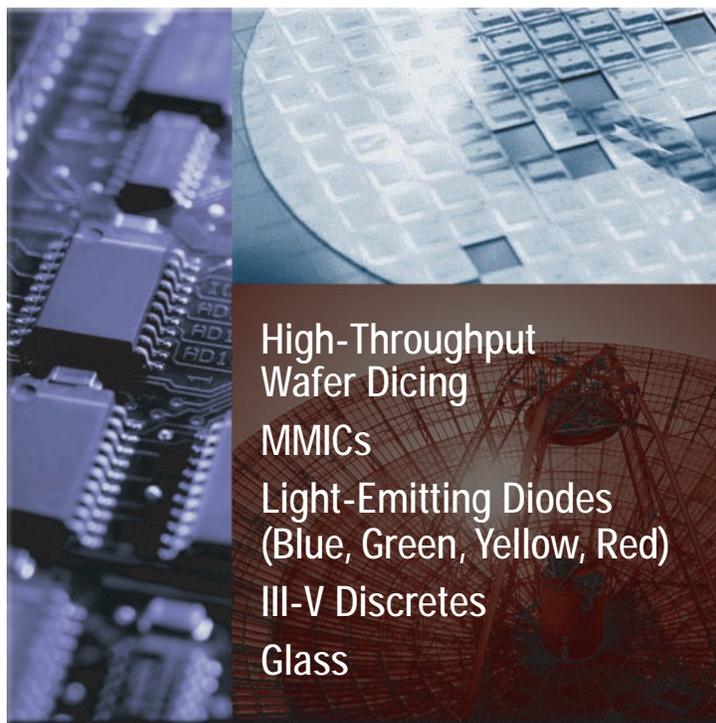
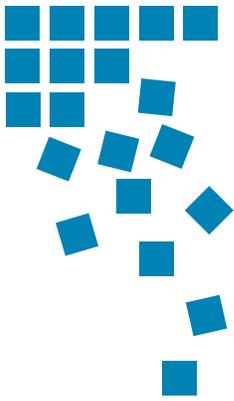


The Breaking Process of the Loomis Industries LSD-110 Series Machines



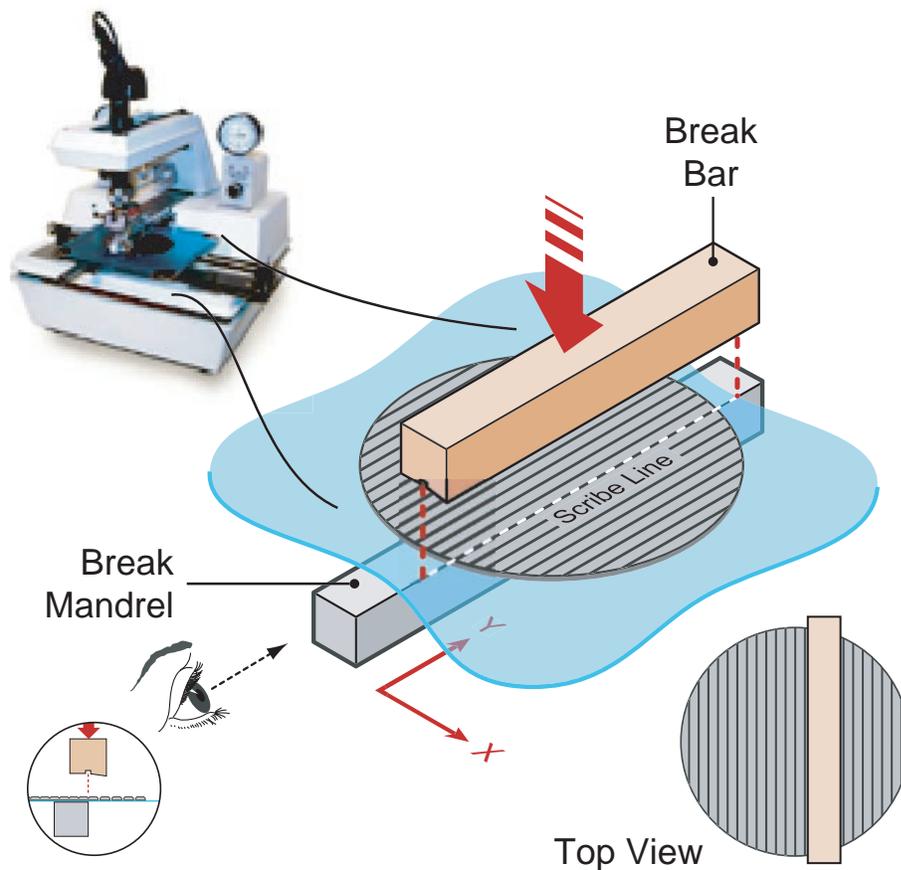


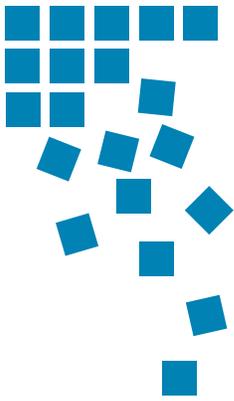
The Breaking Process of the Loomis Industries LSD-110 Series Machines

The Loomis LSD-110 break mechanism is more subtle and faster than the LSD-100. It is very productive, yielding dice with greater than 98% reliability. It can dice three to four 100 mm wafers per hour (assuming a nominal die size of 1x1 mm).

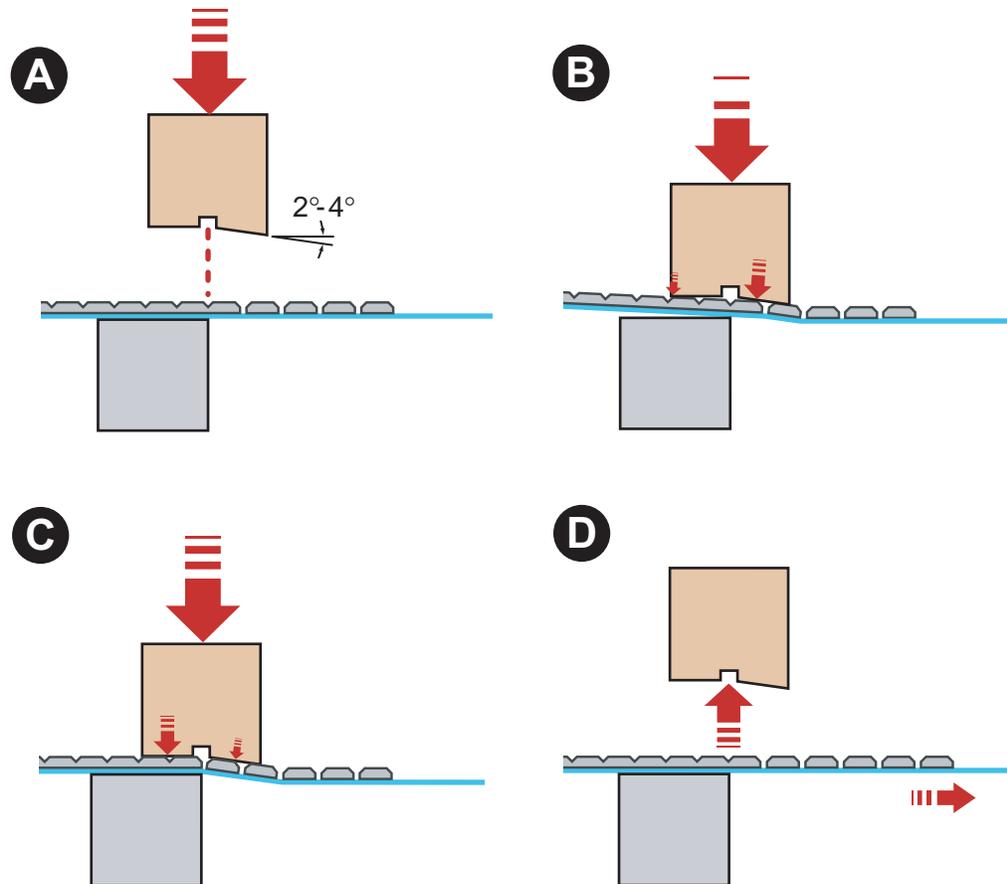


The scribe line guides the break. It is a single crack across the wafer that causes the wafer to break into strips, or the strip to break into dice. The LSD-110, like the LSD-100, uses beam bending to induce tensile strain lateral to the scribe line. The break mechanism extends across the entire scribe line.

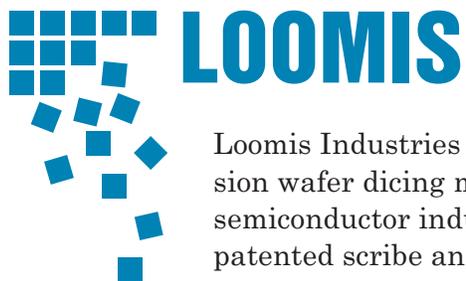




The more continuous the scribe line (e.g. no scribe tool bounce or obstructions in the surface being scribed), the better the break yield. Scribe line uniformity or continuity dictates the nature of fracture failure. Fracture failure is progressive and starts at one end of a scribe line and travels to the other end. Any discontinuity or interruption of the scribe creates an opportunity for misdirection of the break. At a discontinuity of the scribe line, the break can follow a crystal plane that is nearly parallel to the scribe line. If these crystal planes are out of parallel with the scribe lines by more than 6° the chances are good that an intermittent scribe line will cause an errant break.



The right hand plane on the break bar is inclined at 2° to 4° . The cantilever portion of the wafer is bent 2° to 4° . If the scribe line is ineffective, breaking is unlikely to occur. Loomis refers to this as "Controlled Strain Breaking."



Loomis Industries designs and manufactures precision wafer dicing machines for the high-technology semiconductor industry. The machines incorporate patented scribe and break components, advanced positioning technologies and a real-time imaging system, yielding dice with unprecedented reliability - that means a lot to our customers' bottom line. The machines are easy to use and customizable, capable of being tailored to the specific installation or application requirements of each customer. For more information, call or visit us online.

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