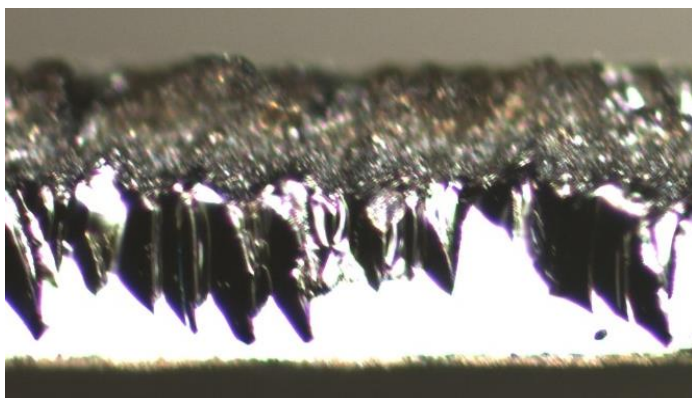


# Q.ANTUM DUO – Improve Mechanical Stability

**DUO Technology developed by Hanwha Q CELLS → laser process w/o mechanical snap**

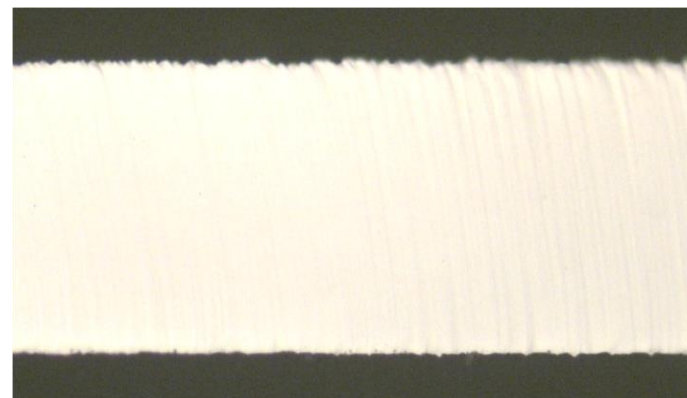
- reduced laser time and energy needed
- smoothly cut edge demonstrates improved stability

## **Traditional Half Cell Technology** **Laser Scribe & Mechanical Snap**



**Melts silicon**  
**Rough edges due to snapping step**  
**Damage to wafer by laser**  
**Reduced mechanical stability**  
**Potential for issues with cell cracks**

**Damaging process = more cracks**



**No melting of silicon**  
**Smooth edges (no mechanical step)**  
**+ 40% improved mechanical stability**  
**Fewer cracks**  
**Lower annual degradation**

**More stable than other sawn edges!**