

SolarTech Power Solutions

Communication Base Station solar Silicon Wafer Slicing Plant



Overview

In the PV industry, the production chain from quartz to solar cells usually involves 3 major types of companies focusing on all or only parts of the value chain: 1.) Producers of solar cells from quartz, which are c.

Can wire sawing produce crystalline wafers for solar cells?

Wire sawing will remain the dominant method of producing crystalline wafers for solar cells, at least for the near future. Recent research efforts have kept their focus on reducing the wafer thickness and kerf, with both approaches aiming to produce the same amount of solar cells with less silicon material usage.

Can thin silicon wafers be made with increased mechanical strength?

Hence, there is a critical need to address the problem of manufacturing thin silicon wafers with increased mechanical strength. The wafers are cut from silicon ingots using the wire sawing process (see Figure 1), which is an expensive step in the solar cell manufacturing process.

Why is wafering important for solar cells?

Another relevant field of research is the reduction of the wafer thickness in order to produce more wafers per kilogram silicon. Finally, the wafering process step, in combination with the material quality, defines the mechanical properties of the final solar cell, as the wafering process can damage the wafer's surface.

How are silicon wafers cut?

The wafers are cut from silicon ingots using the wire sawing process (see Figure 1), which is an expensive step in the solar cell manufacturing process. Recent industry trends indicate a shift from the loose abrasive slurry (LAS) sawing to fixed abrasive diamond wire sawing (DWS) process for slicing silicon wafers [2, 3].

Are textured TSRR wafers suitable for manufacturing silicon solar cells?

To validate the industrial compatibility of TSRR structure, we further prepared textured TSRR wafers and performed some key manufacturing processes for mass production of silicon solar cells based on 182×182 mm² pseudo-square wafers with an original thickness of 150 μm which are generally used in industry.

Can thin silicon be used to prepare ultrathin silicon wafers?

In this contribution, we present a thin silicon with reinforced ring (TSRR) structure at the edge region, which can be used to prepare ultrathin silicon wafers with a large area and provide support throughout the solar cell preparation process to reduce the breakage rate.

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