

PO1025

## **Rapid Stripping of Brass-plating on Fine Saw Wire by Triangle-type Multiple Magnetron Plasmas**

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Silicon wafer used crystal silicon solar cell is carved out from the silicon ingot by saw wire. Saw wire is covered with brass (Cu: 65%, Zn:35%) plated to need in wire drawing process. As a result basis of plating (especially copper) are diffused in the wafer as contamination. So the electric conductivity changes, and there is a possibility of cause to decrease solar cell efficiency. Therefore the saw wire with Cu free is strongly required. To remove brass plating on saw wire, we propose to use plasma dry process instead of wet process for wire stripping. Dry process has advantages that the waste liquid treatment is unnecessary and pollution policy of flue-gas treatment etc. become easy and high reaction rate was obtained. New type of line-shaped magnetron plasma source has been developed by applying magnetic field to triangle-type electrodes. The discharge characteristics, the stripping results and the wire temperature were investigated. To get higher stripping rate, "Triangle Magnetron Plasma" was proposed. For multiple wire stripping, "Multiple Unit Magnetron Plasma System" was newly developed. The stripping effects were successfully established by using high density magnetron source with 20mm gap in an axially applied magnetic field. From the EDS analysis results of wire surface after plasma stripping during 30sec, it is clearly shown that Zn was removed after 10sec stripping and Cu after 30sec. (Fe:38.5%→97.7%□Cu:39.3%→2.43%□Zn:22.2%→ 0.03%)

### **Keywords**

Sputtering

Etching

Stripping

Saw Wire

Brass Plating