THE SAW-DAMAGE-INDUCED STRUCTURAL DEFECTS ON THE SURFACE OF SILICON CRYSTALS

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Abstract

During the process of cutting silicon ingots into wafers, saw damage is produced on the surface of silicon crystals. This saw damage induces defects during the oxidation of the silicon. Unlike silica slurry wet blasting, which is known to induce OISF (Oxidation-Induced Stacking Faults), saw damage produced by the wire sawing process induces the generation of dislocation loops during the oxidation process. The type of defects formed during the oxidation process seems to depend on the amount of damage: if the damage is bigger than some critical value, then dislocation loops are generated. If the damage is smaller than this critical value, then stacking faults are generated during oxidation.

(c) Sliced with wire saw
Fig. 1. Surface roughness of the specimen measured with Vecco metrology group NT 1000 (3D Micro vision)