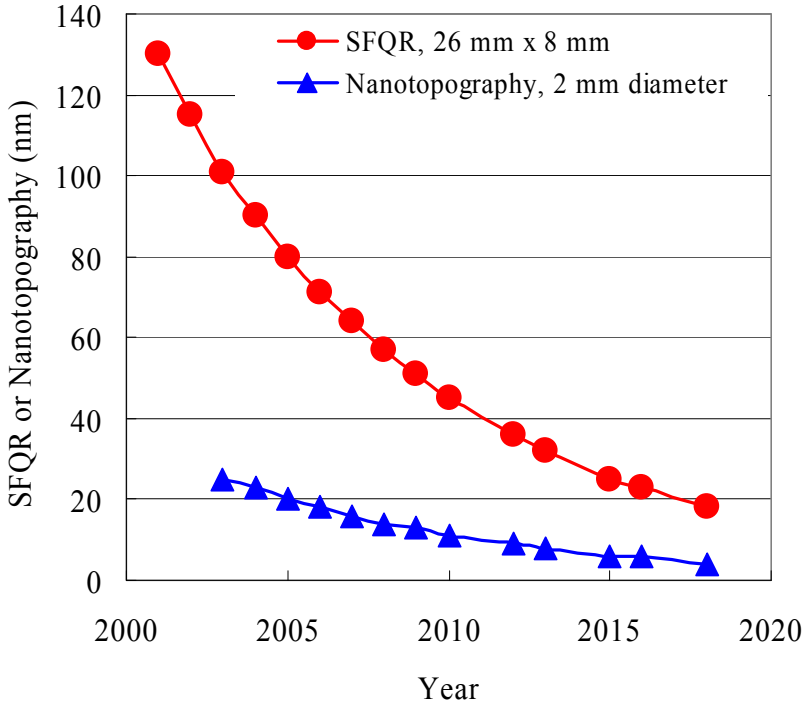


Fig. 1. Increasing flatness requirements by semiconductor industry (after [5]).

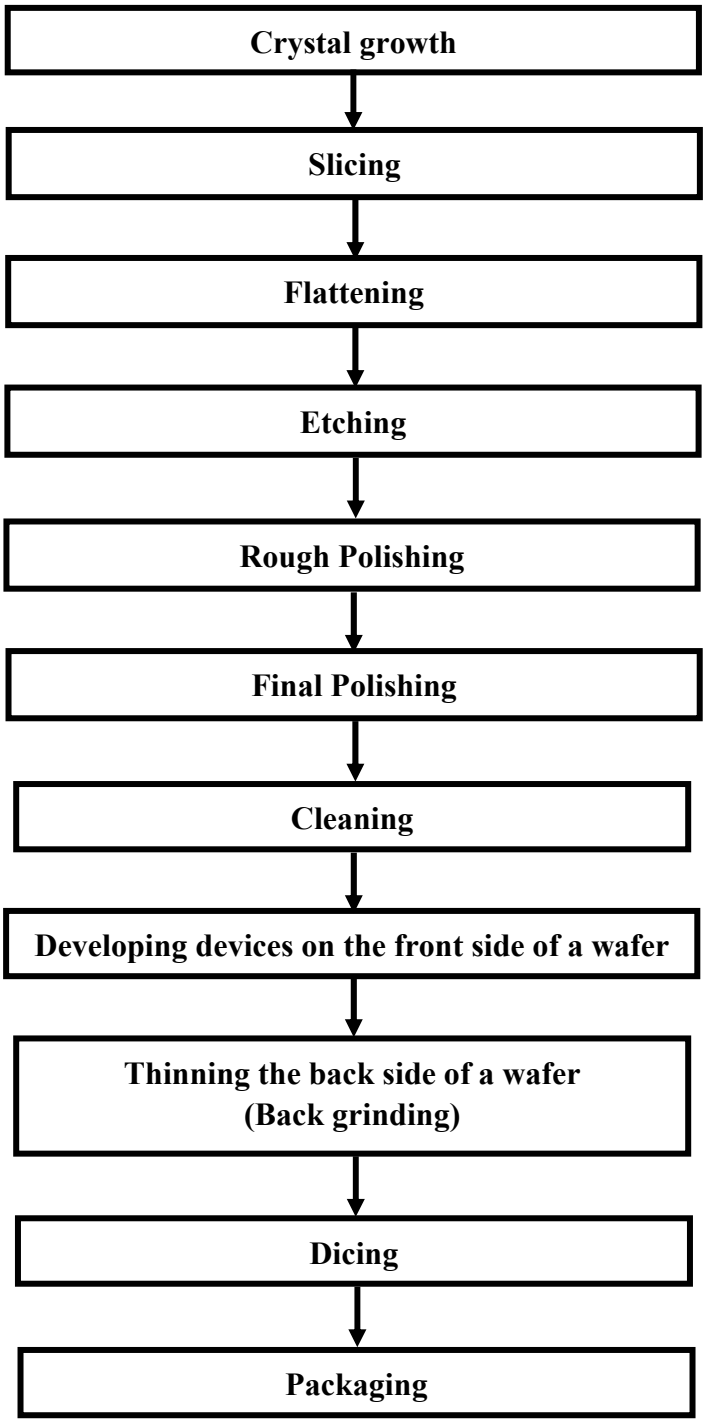


Fig. 2. Typical process flow for manufacturing of semiconductor devices (after [20-24]).

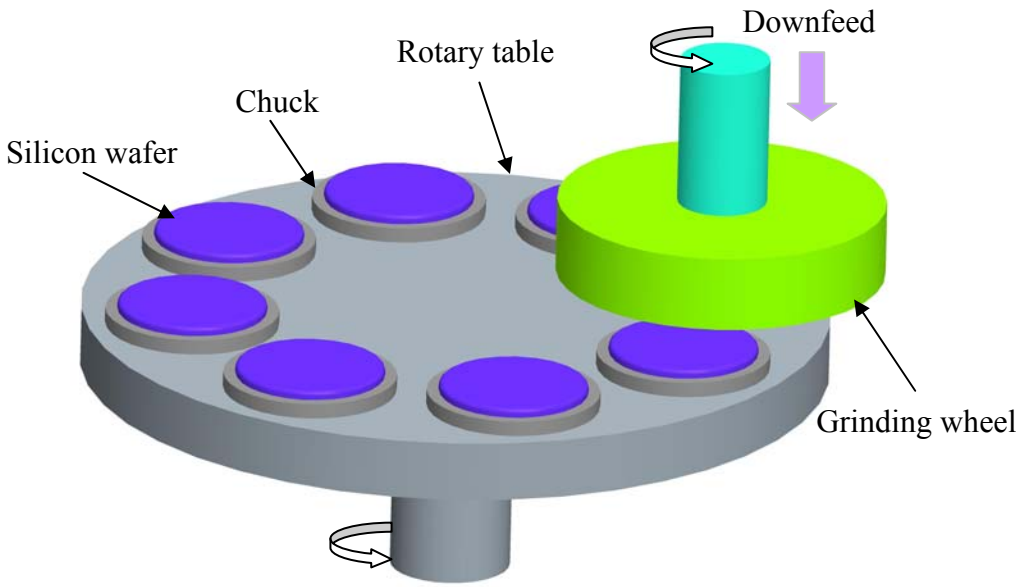


Fig. 3. Illustration of Blanchard-type wafer grinding (after [37-40]).

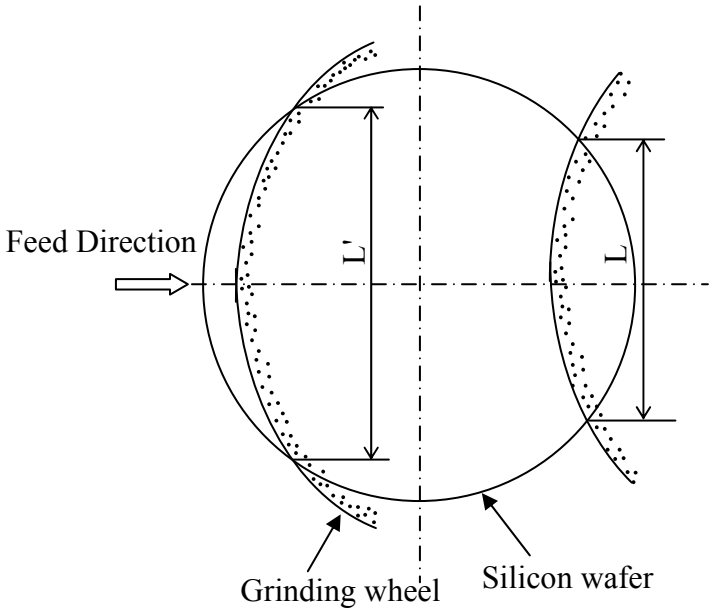


Fig. 4. Contact length between grinding wheel and silicon wafer in Blanchard-type and creep-feed wafer grinding (after [40]).

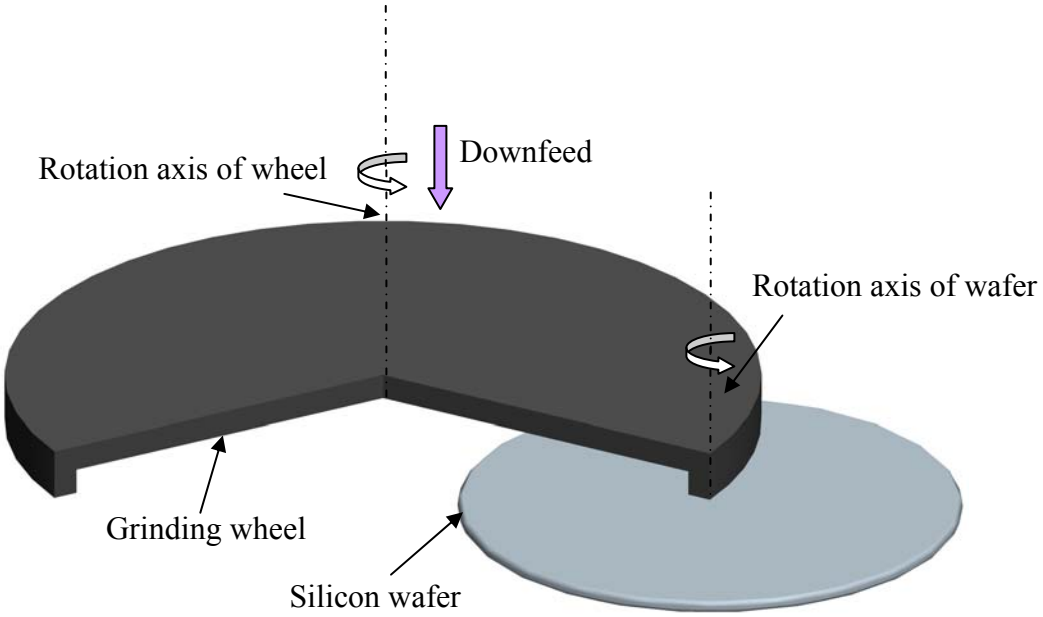


Fig. 5. Illustration of in-feed wafer grinding (after [43]).

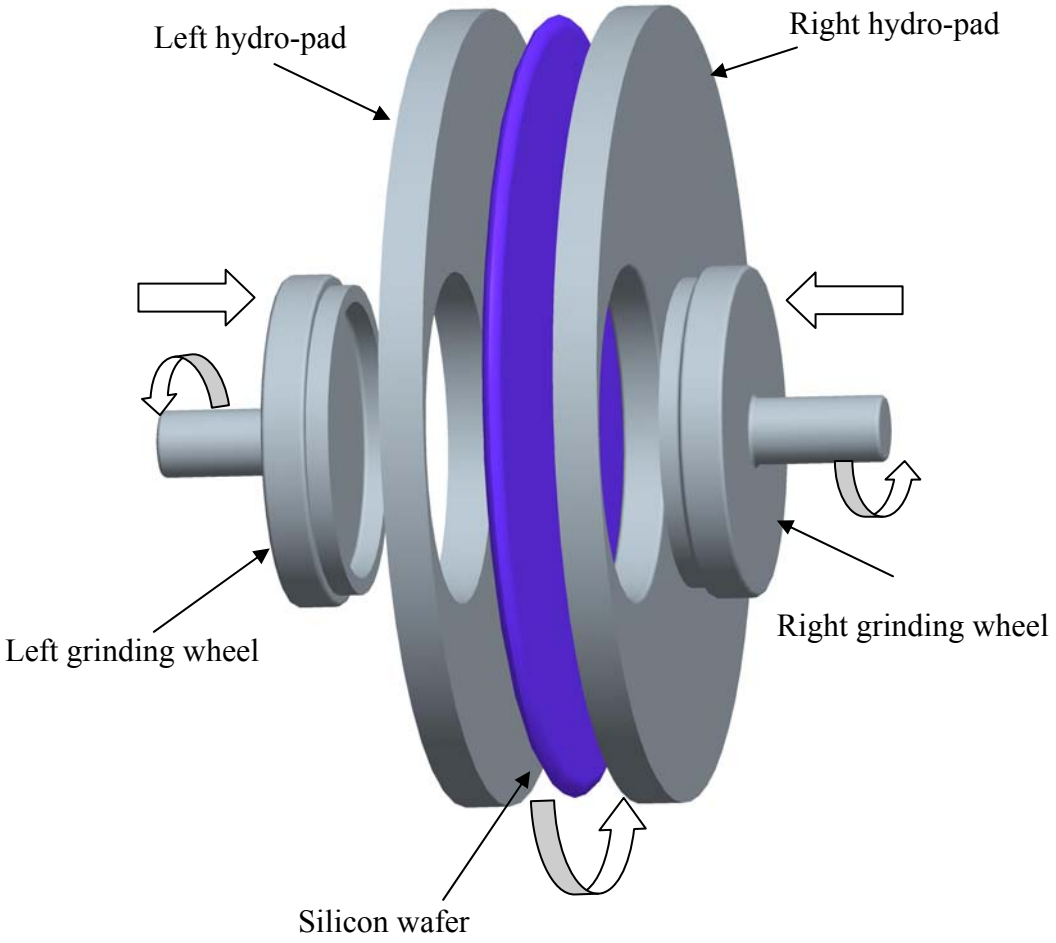


Fig. 6. Illustration of simultaneous double-side grinding (SDSG) (after [48]).

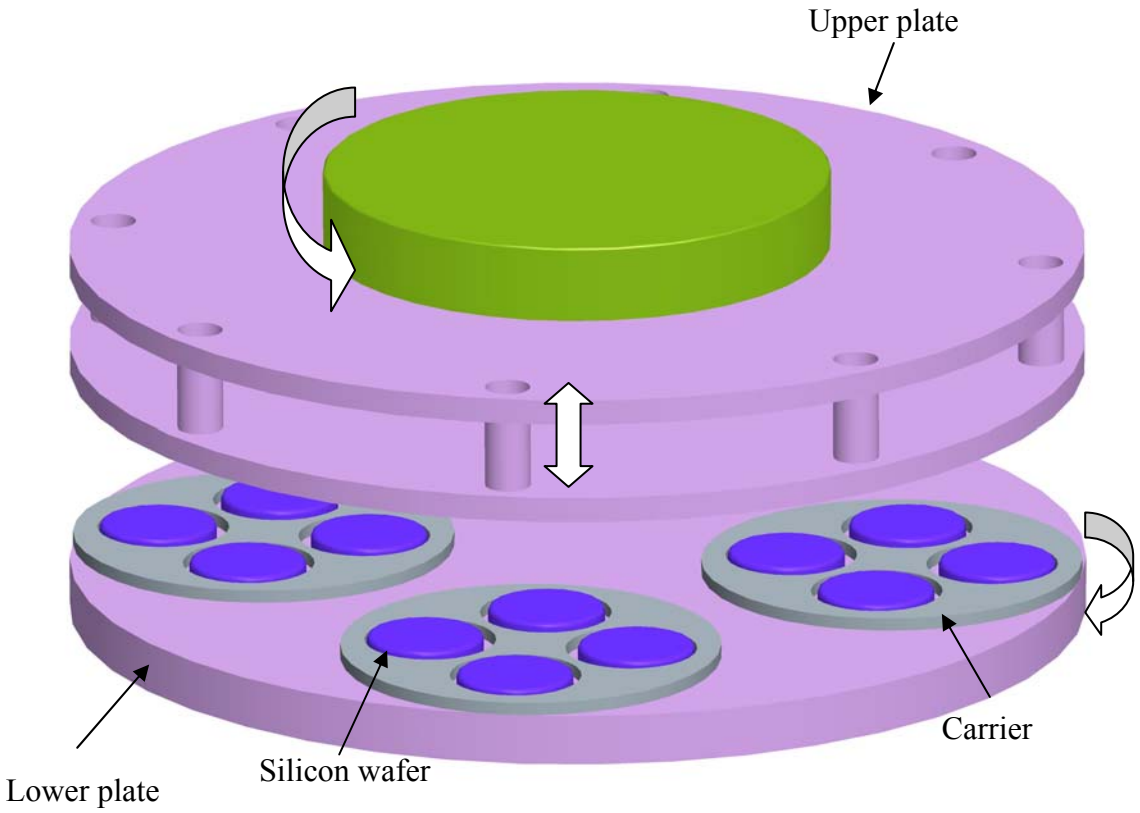


Fig. 7. Illustration of lapping (after [65]).

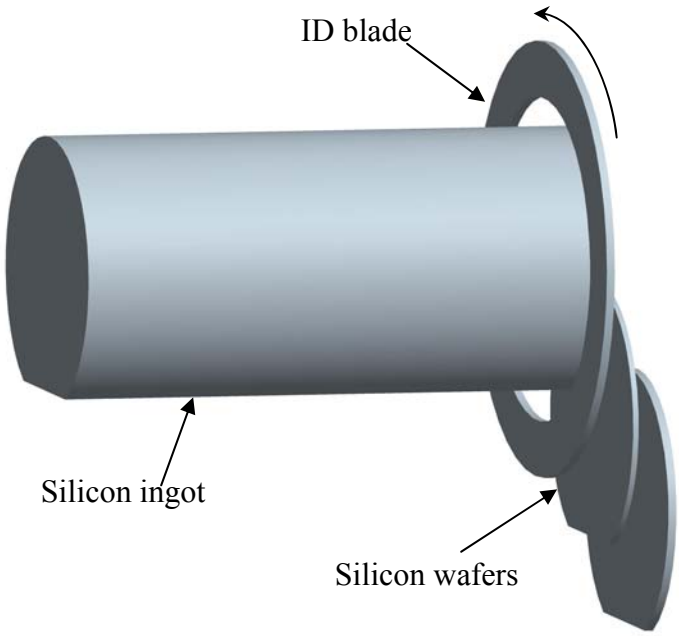


Fig. 8. Illustration of ID sawing (after [71,72]).

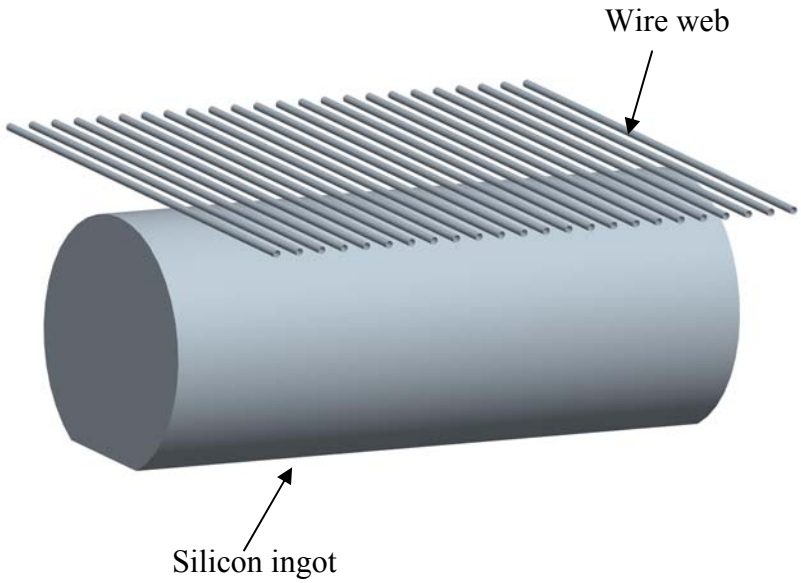


Fig. 9. Illustration of wire sawing (after [76]).

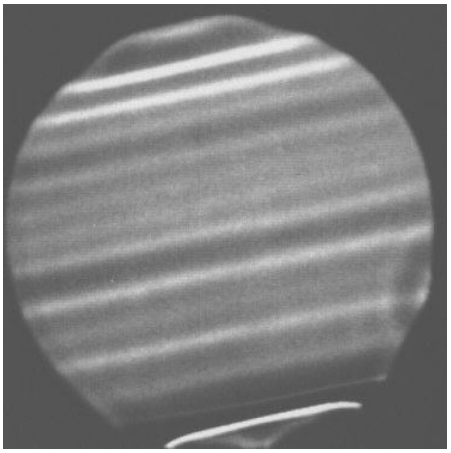


Fig. 10. Waviness induced by wire-sawing [80].

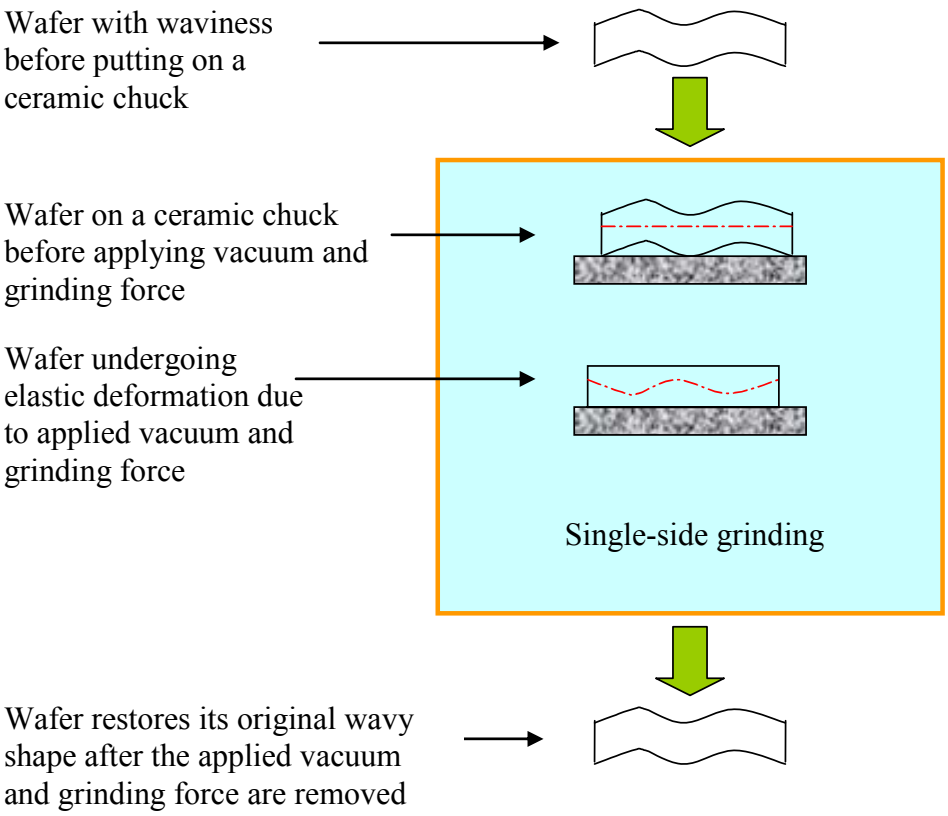


Fig. 11. Wafer deformation during single-side grinding (after [80]).

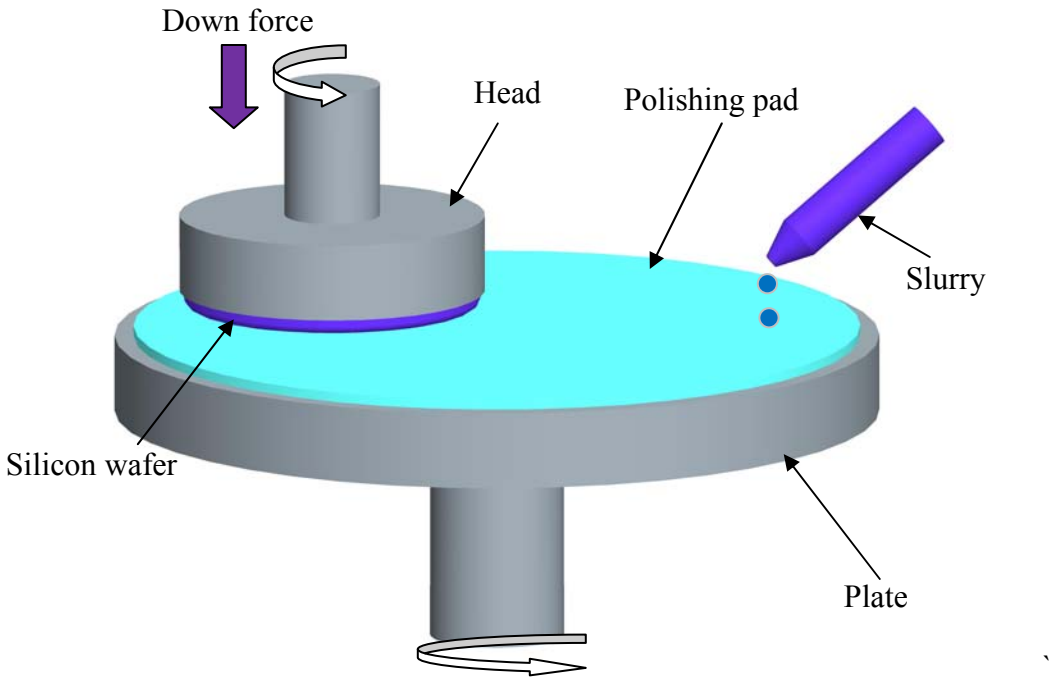


Fig. 12. Illustration of single side polishing (after [91]).

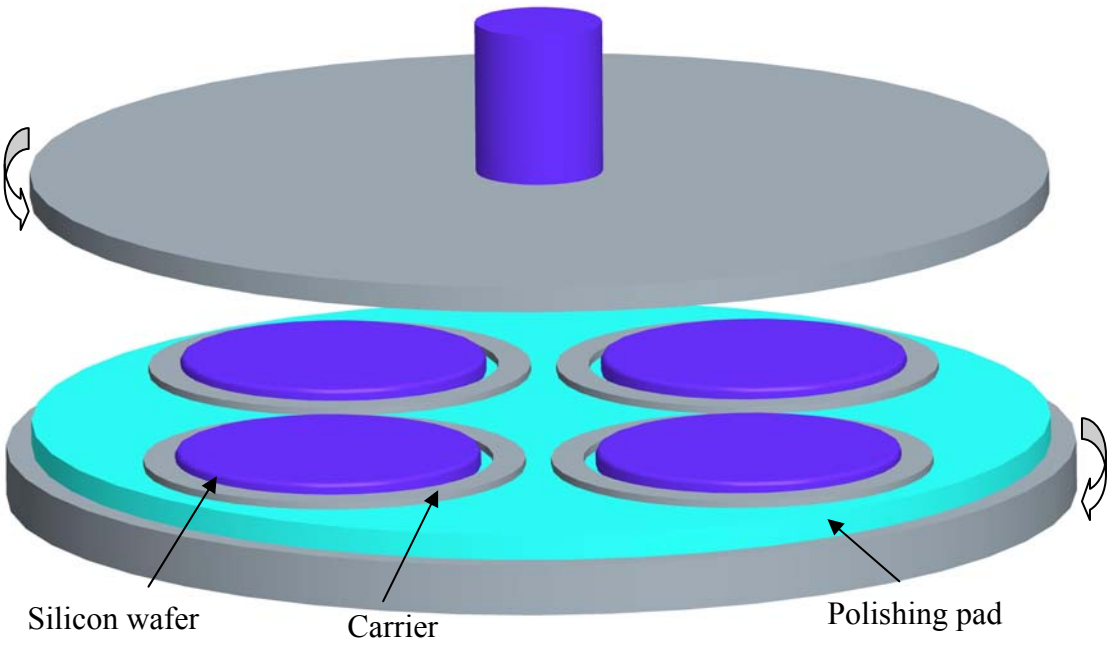


Fig. 13. Illustration of double-side polishing (after [95]).

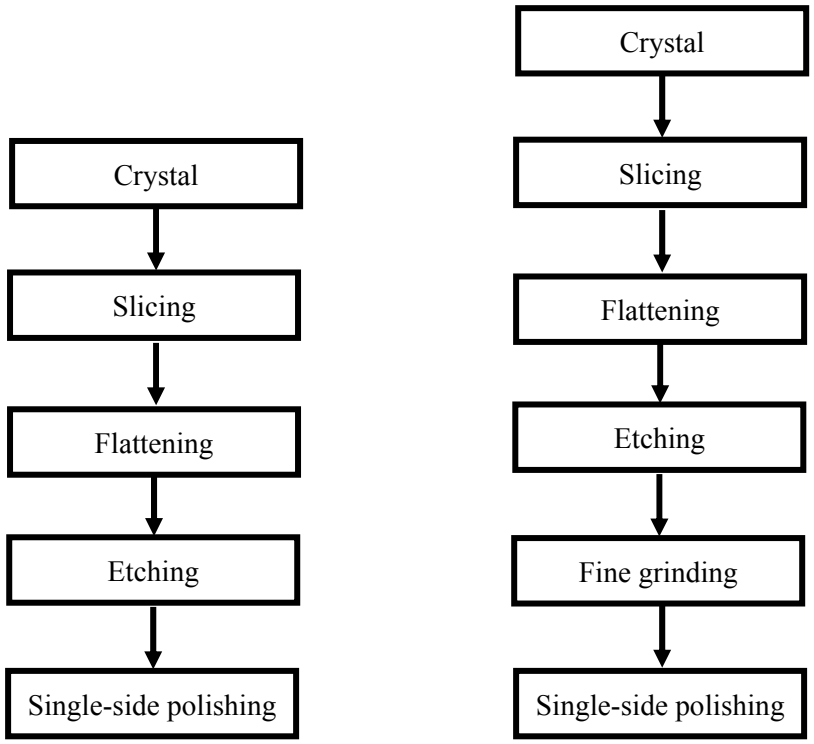


Fig. 14. Process flows for single-side polished wafers (a) with and (b) without fine grinding of etched wafers (after [98]).

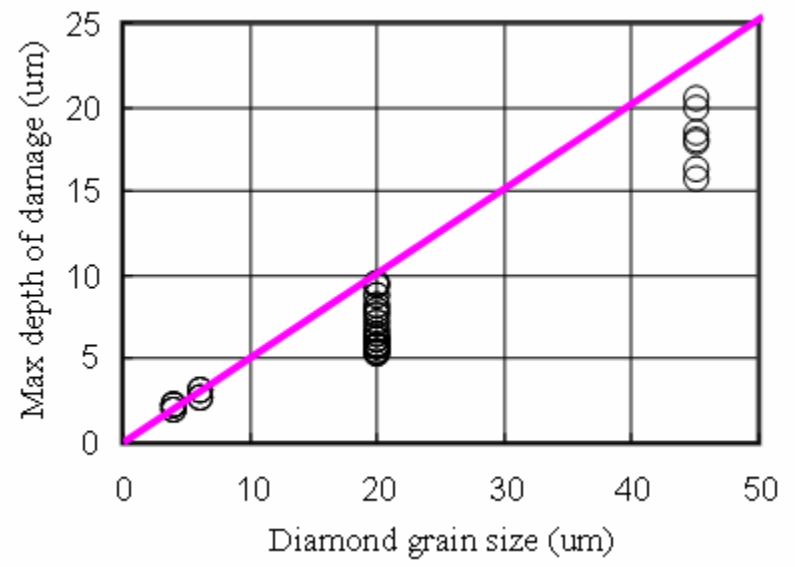


Fig. 15. Relation between diamond grain size and maximum depth of damage [99].