

University of Minnesota Nano Fabrication Center

Process Notes

Equipment: SB6 Wafer Bonder
Author: Suzanne Miller
Revision: 1

Date: 10/13/04

Description: Wafer Cleaning and Surface Preparation for Silicon Fusion Bonding:

Wafer cleanliness and surface preparation are essential to achieve a good bond. The following is a procedure recommend for silicon to silicon bonding, silicon to oxide bonding, and oxide to oxide bonding.

I. Wafer Cleaning:

The wafers should be cleaned prior to bonding. Cleaning is done to rid the wafers of particles. Particles on the wafer will cause voids in the bond.

A. Piranha Clean

1. Pour fresh chemicals, heat to 120C.
2. Clean wafers for 15 minutes.
3. Rinse wafers for 15 minutes.
4. Spin dry unless doing the RCA2 clean immediately following.

Note: This can be done several days ahead of bonding.

II. Wafer Surface Preparation:

The following clean will help rid the wafer of particles and conditions the wafer surface to be hydrophilic. This clean should be done immediate prior to bonding. First do the RCA2 clean then immediately go to the RCA1 clean. The bond should be done within 1 hour of cleaning.

A. RCA2 Clean

1. Pour fresh chemicals, heat to 80C.
2. Clean wafers for 15 minutes.
3. Rinse for 10 minutes.

B. RCA1 Clean

1. Pour fresh chemicals, heat to 80C.
2. Clean wafers for 15 minutes.
3. Rinse for 10 minutes.
4. Spin dry

Note: Skip the HF dip.