

Laser ablation \rightarrow plastic is removed
Locally by sublimation
using intense laser
Beam

Bonding of 2 wafer

\rightarrow Eutectic Bonding

Gold-Si \rightarrow @ 363°C

Si-Si Bonding (DB \rightarrow direct bonding)

\rightarrow @ 300-~~600~~ 1000°C \rightarrow elevated temp
 \rightarrow Boiling

\rightarrow Annealing @ 800-1100°C
to improve Bond quality

Immerse in
 \rightarrow H_2O_2 - H_2SO_4 mix or boiling in HNO_3
or dil H_2SO_4

Glass-Glass DB

- ① Clean by $H_2O - NH_3 - H_2O_2$ solⁿ
- Moisture removal @ $130^\circ C$
- @ $600^\circ C$ for 6-8 hrs (Thermal Bonding)

Metal-Metal

- Press → 276 bars
- $920^\circ C$ @ 4 hrs

Polymer-Polymer

- for PDMS i.e. of low Surface Energy
- surface treatment with O_2 -plasma

Fluidic-Interconnects

Press Fit → Glued

- utilises elastic bond
- sealing force is small
- ~~Good~~ for low Press application

- surface roughen^{ed} for better adhesion
- polymer glue is used
- Glass Capillary & Si wafer

Kovar Tube → alloy of

- 29% Ni
- 17% Cu
- 54% Fe

@ $1020^\circ C$

Integrated O-ring

- ① Etch of annular area (by DRIE)
- ② Deposition of oxide (SiO_2) or nitride (Si_3N_4) layer
- Si-rubber squeezed into the cavities
- Fluidic access will be opened from the back side by DRIE
- Oxide/Nitride layer is etched in buffered HF acid and SF_6 plasma