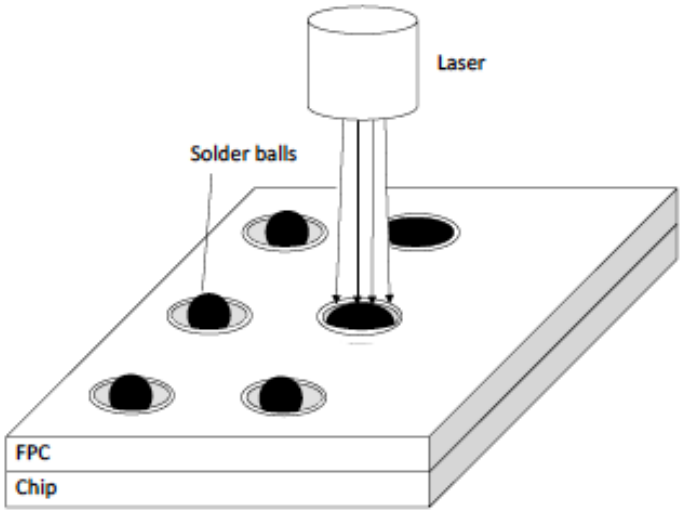
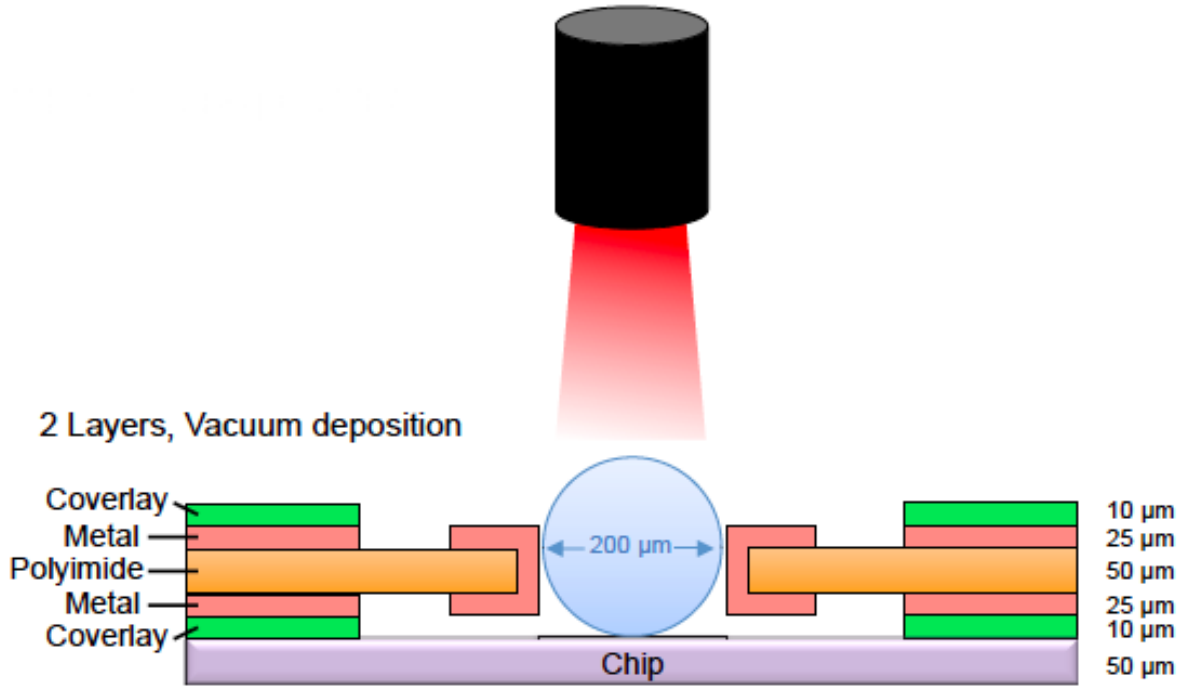
New bonding technology

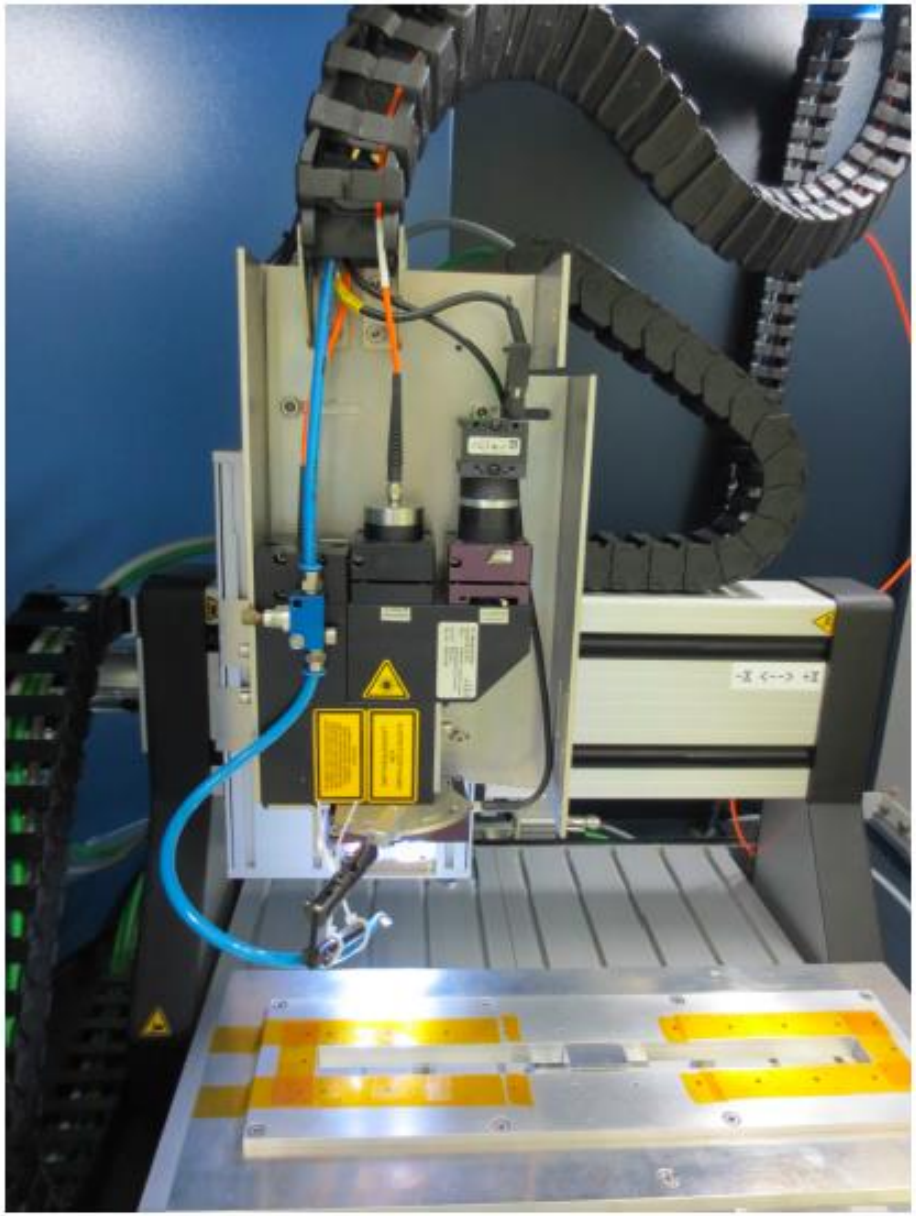
Chip Assembly – laser soldering

Interconnection of Pixel chip on flexible printed circuit
Laser soldering (baseline)



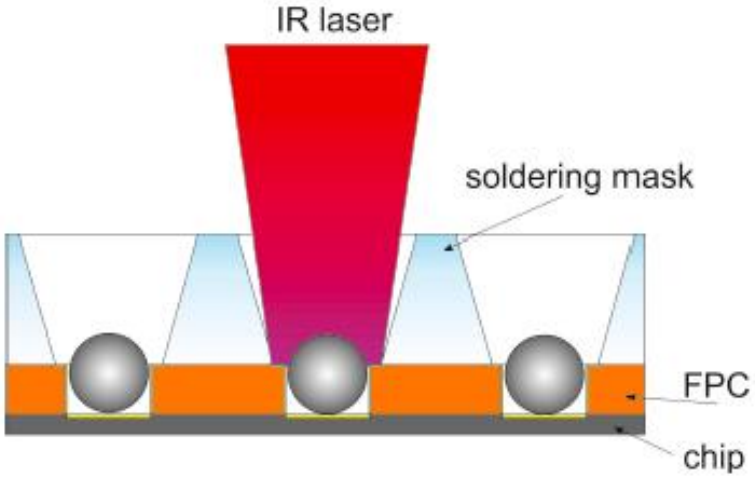


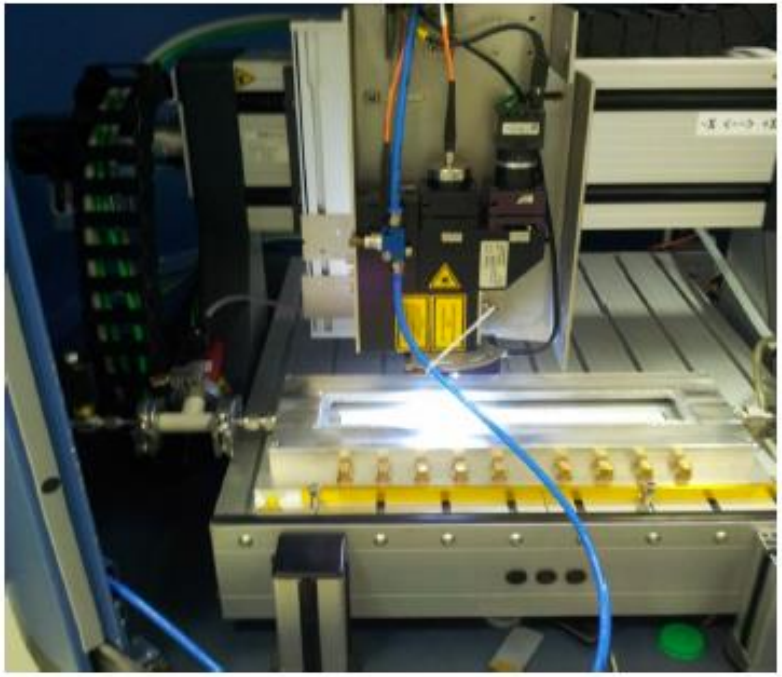
Laser soldering machine (Dr. Mergenthaler GMBH) put in service at the CERN ITS Lab (Sep 2013)



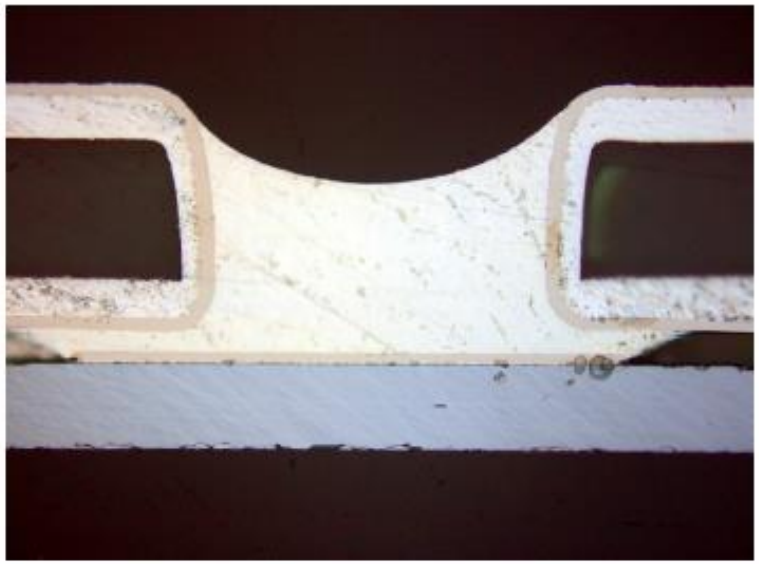
Selective laser soldering

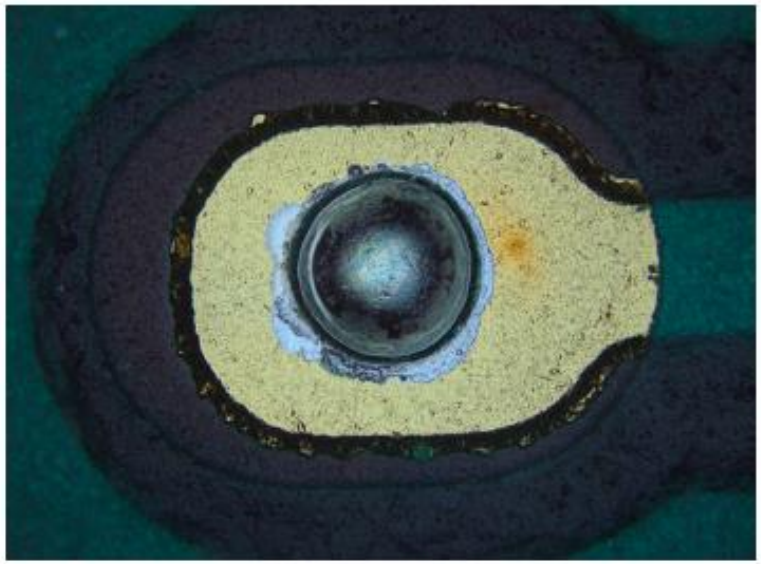
- Interconnection between FPC and chip by flux-less laser soldering of 200 μm diameter Sn/Ag(96.5/3.5) balls (227 °C melting T) in vacuum ($\leq 10^{-1}$ mbar)
- IR diode laser, 976 nm, 25 W, 50 mm focal length, 250 μm beam spot size
- Laser power modulated by pyrometer, programmable T profile ensures precise limitation of heating
- Soldering mask (in Macor® or Rubalit ®) used to push FPC on chip and guide soldering balls inside FPC vias





Good Soldering





Bad Soldering