Short update on FEC lab and packaging process status

Hamburg-CMS Tracker Upgrade Meeting - Phase I
3 May 2013

Femto FC Bonder installed and accepted

PICTURE OF FEC BONDING MACHINE INSIDE THE CLEANROOM

April 12, 2013

Installed: Femto Flip-Chip Bonder at FEC lab
Commissioning in progress

FEC Lab installations

AGREED PLANS

Formic acid ventilation Friday, **April** 5th	finished
Compressor installation Friday, **April** 5th	finished
Femto installation Monday to Friday, **April** 8th to 12th	finished
SBB installation Monday to Friday, **April** 22nd to 26th	delayed

SB2 Jet installation plans

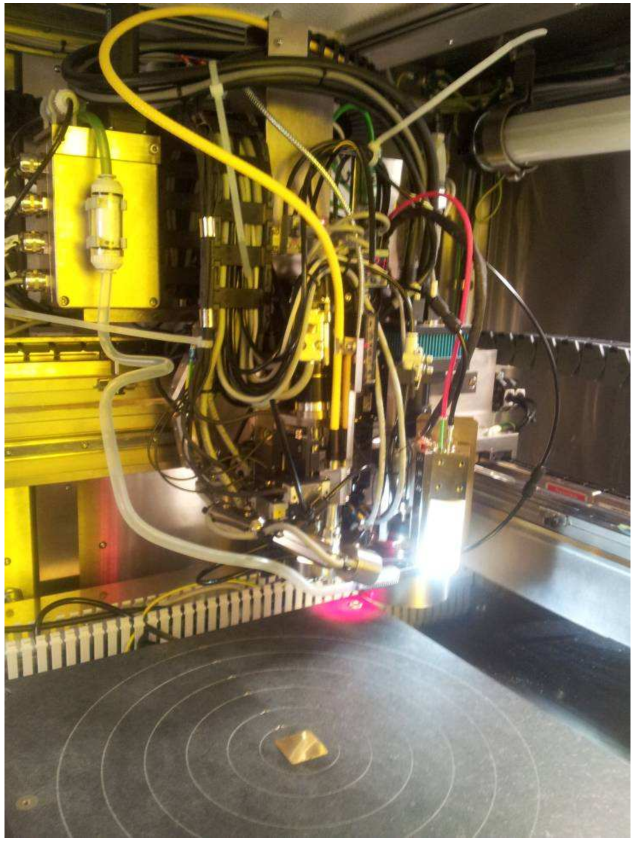
Delivered today

To be installed next week

Training and acceptance until May 17th

Preacceptance of SB2 machine finished

PICTURES OF THE FEC MACHINE AT PAC TECH



- Placement speed > 5 Hz achieved
- Average speed per 4160 bumps incl. cleaning etc.: 3.5 to 4 Hz achieved

Prototype processes ongoing at Pac Tech

DETAILS AND PLANS

Analog ROC wafer to be processed in **April** ← Delayed (no offer yet)

- 1 setup wafer
- 1 good one

Sensor wafers (old ingot) to be processed in **April** ← Delayed but in process

- 1 setup wafer
- 5 good wafers

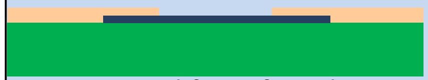
VTT Dummies for 15 µm opening ← Setup completed, wafers in process

- 15 wafers currently in process setup
- Process should work beginning of **April**

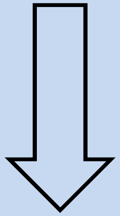
Electroless plating of 15 µm openings works fine and better than expected

electroless UBM & solder jetting

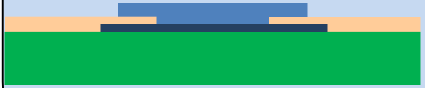
Step 1:UBM Process

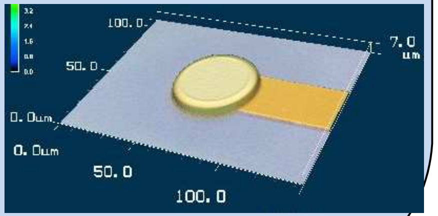

Contact pad from foundry


UBM-line



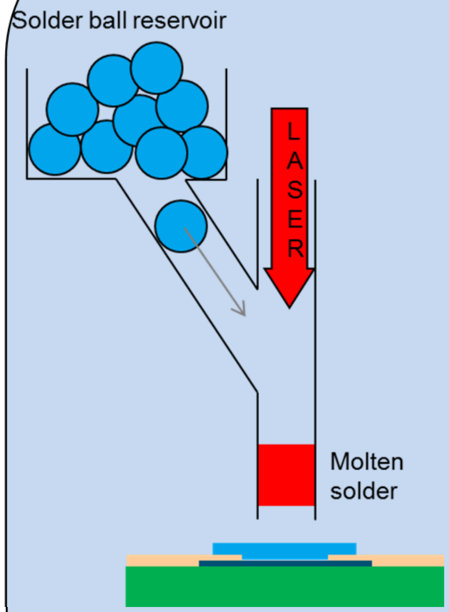
ENEPIG
e-less Ni 5µm,
e-less Pd 200 nm,
immersion Au 50 nm

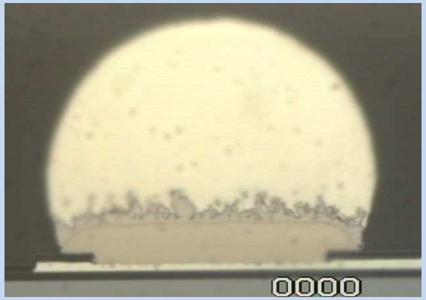

Pad after ENEPIG deposition



Laser scan microscopy

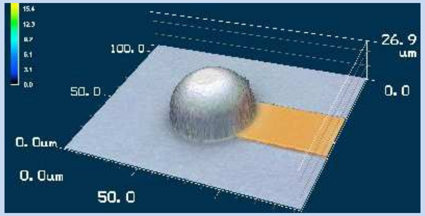
Step 2: Jetting Process





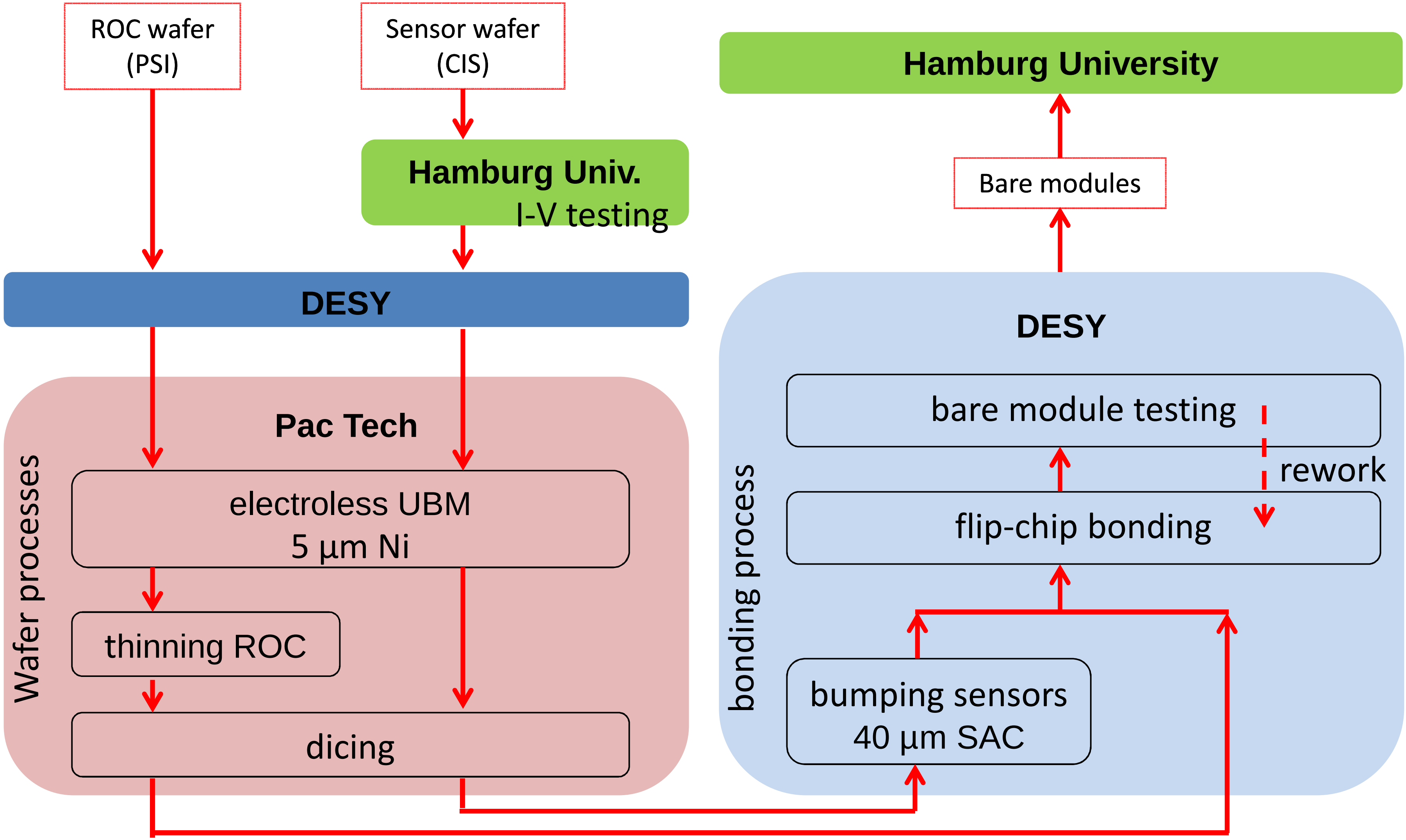
Cross section micrograph

DESY
40 µm,
5 Hz
-> 4 h / sensor



Laser scan image of pad with SAC solder bump

Bump Bonding plan at DESY



ROC wafer (PSI)

Sensor wafer (CIS)

Hamburg Univ.
I-V testing

DESY

Pac Tech

Wafer processes

electroless UBM
5 µm Ni

thinning ROC

dicing

Hamburg University

Bare modules

DESY

bonding process

bare module testing

rework

flip-chip bonding

bumping sensors
40 µm SAC