

Monday, 16 November 2020, 15:00 CET
EPIC Online Technology Meeting on PIC Testing

Scaling up photonic integration: Testing chips and wafers

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Company introduction

- Providing fabless photonic integration services since 2011.
- Offices and clean-room test labs in Spain.
- 18 members of extensive academic and industrial experience.
- 12+ years in the field of integrated optics and photonics.
- Recently acquired by Hitachi High-tech



Serving almost all PIC markets

Communications

- Optical Datacom
- FTTx and Access Networks
- Microwave/RF Photonics
- Long-haul and transport networks

Sensing

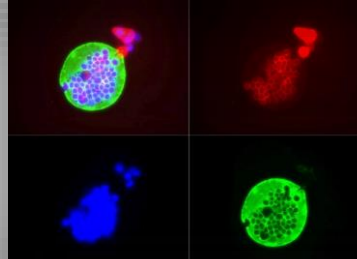
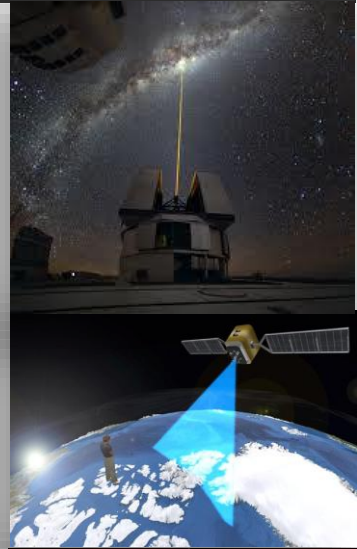
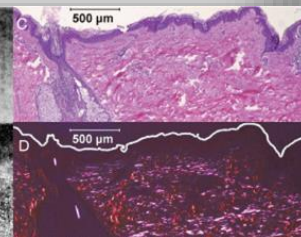
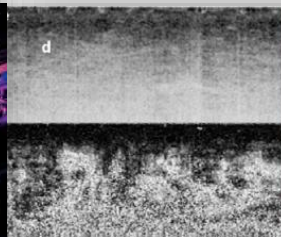
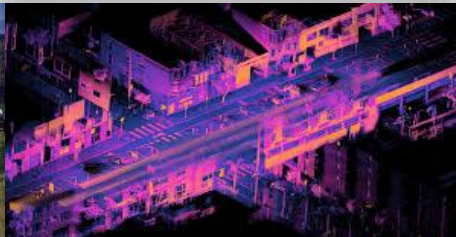
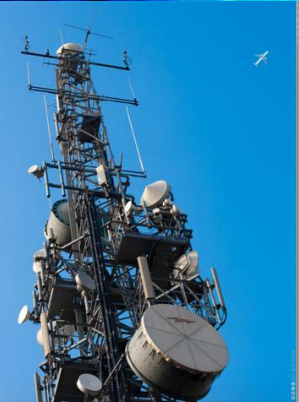
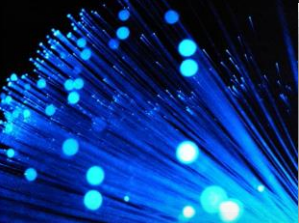
- Fiber sensor interrogators
- Gyroscopes
- Spectrometers
- Interferometers / vibrometers

Signal Processing

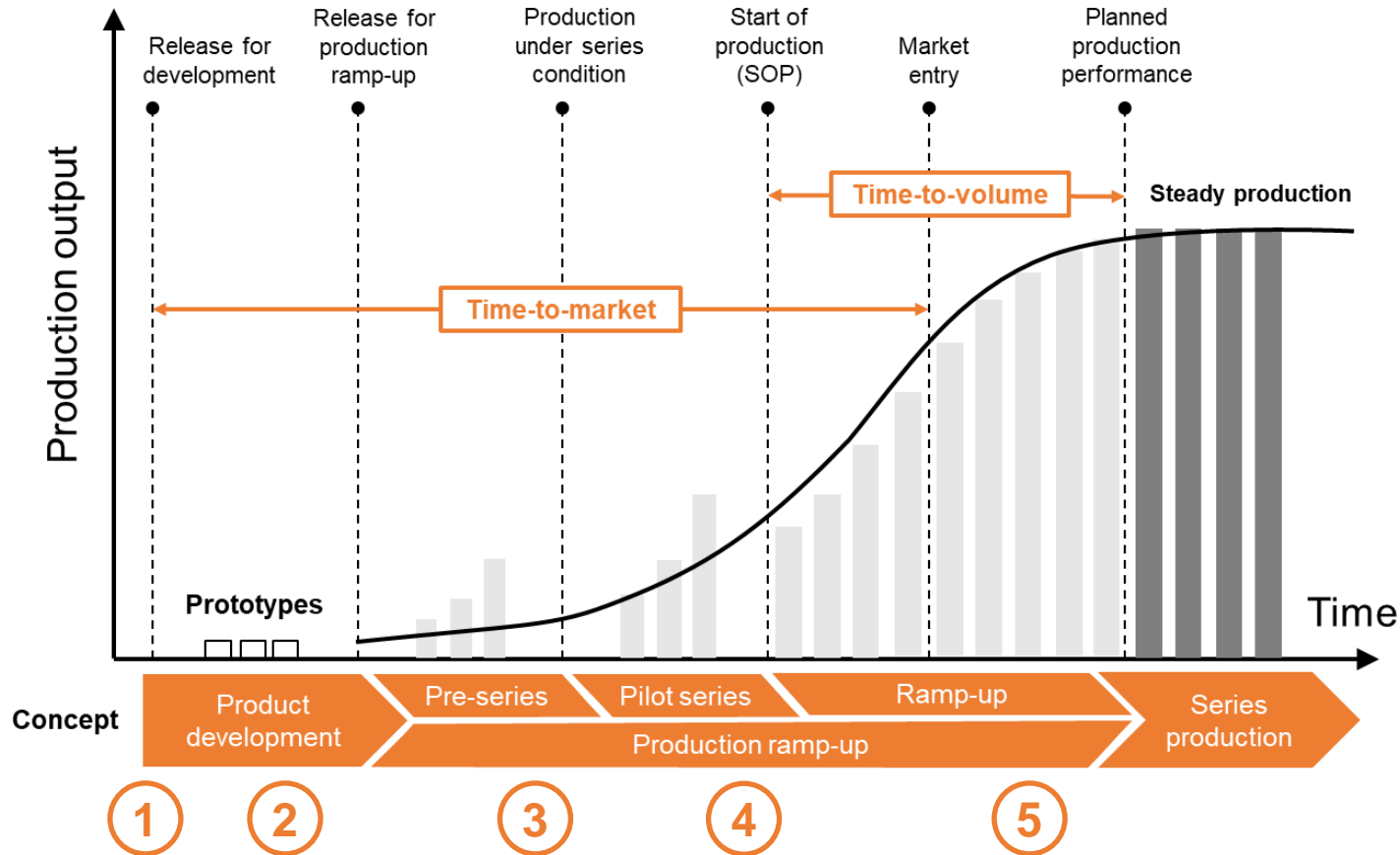
- Artificial Intelligence
- Beamforming/steering / LIDAR
- Quantum Optics (QKD, QRNG)
- Astrophotonics

BioPhotonics

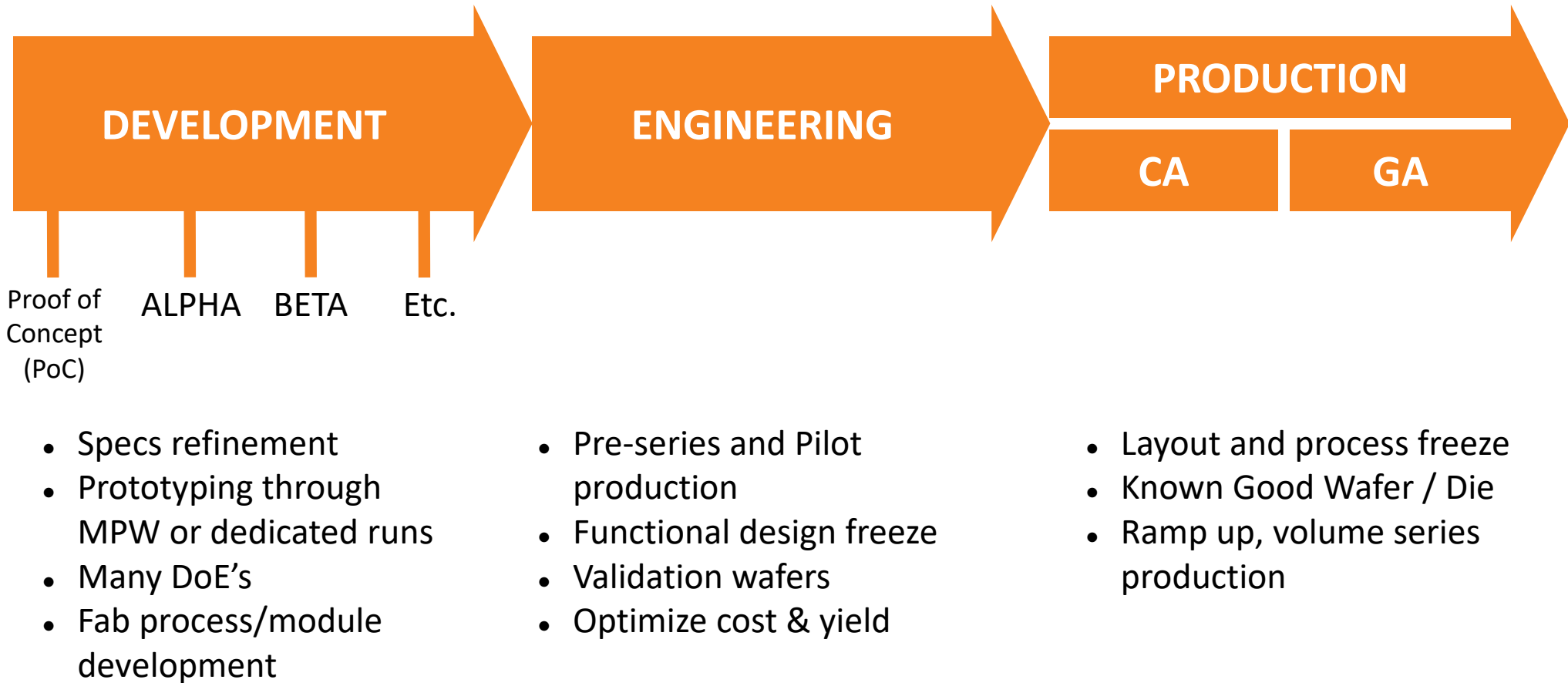
- Medical Instrumentation (OCT)
- Lab-on-a-Chip (flow cytometry)
- Analytics and Diagnostics
- Optical Biosensors



New Product Introduction (NPI)



- Times and volumes will depend on **application product** and **market**.
- Significant **investment** is associated to scaling up.
 1. Pre-seed / Angel (<500k€)
 2. Seed (<2 M€)
 3. Series A (<10M€)
 4. Series B (<25M€)
 5. Series C+ (>25M€)



Validating chips when scaling up



Bare die characterization

- **Qualification during development (10's of dies):** to ensure the product meets requirements
- Fab metrology and PCM info
- Root Cause Analysis (RCA) is critical



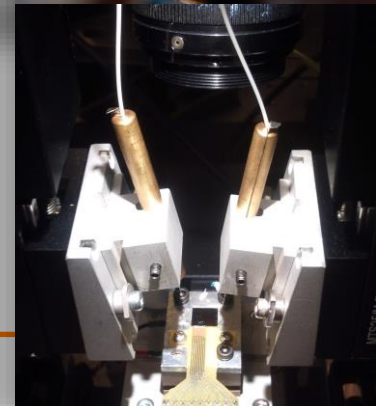
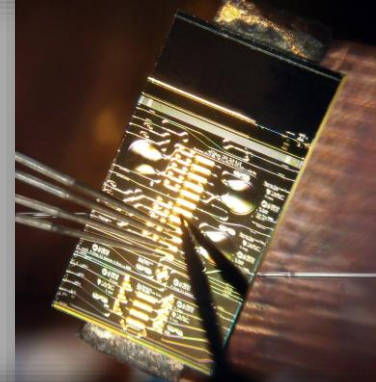
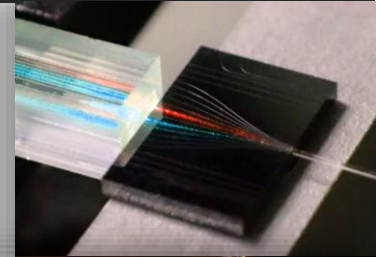
Wafer level testing

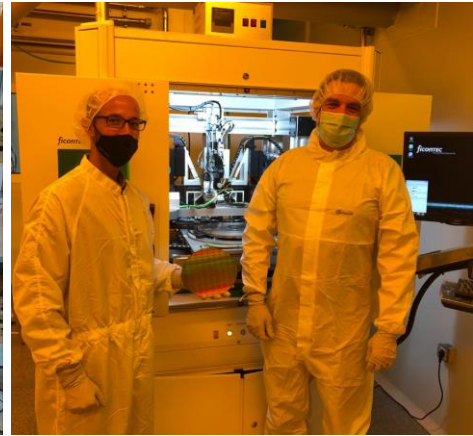
- **Validation during engineering (100's-1000's dies, 10's wafers):** to ensure the manufacturing process produces consistent quality
- **Monitoring during production (100's wafers):** to sample on-going quality
- Vertical testing mostly for Si photonics, challenge to move to edge coupling.
- Combine optical & electrical (DC & RF?)
- Measurement speed, parallelism, scalability
- Big data processing and analytics



Assembly testing

- Package/module level
- Physical/environmental testing
- Certification trials



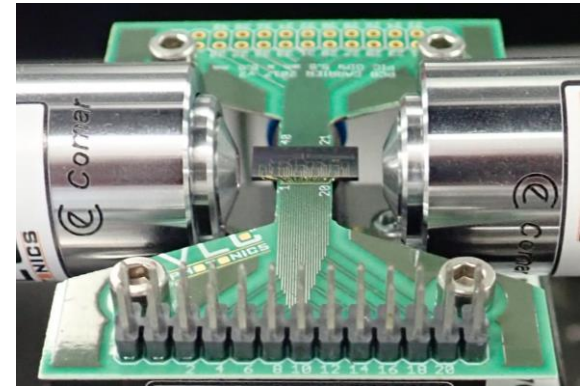
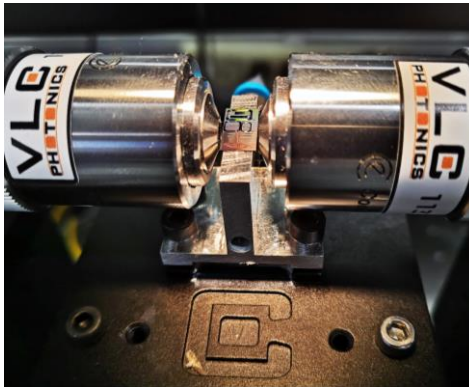
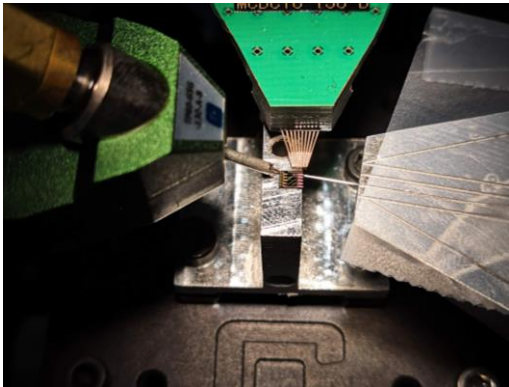


Two clean rooms (ISO class 8 and 6) with:

- 4 semi-automated bare die characterization setups
- 1 fully automated electrical (DC+RF) and optical (2x fiber/FA) wafer prober
- 1 manual electrical (DC) wafer prober
- 1 manual & 1 automated wirebonder
- 1 flip-chip
- 1 thermal testing oven
- 1 microscope & SEM for visual inspection



- Electrical screening
- Vertical and edge optical coupling
- Full spectral analysis
- Insertion loss, cross-talk, polarization dependency, etc.
- Thermal response
- Instrumentation and components for characterizing visible to NIR wavelengths
- ISO 9001 certified processes and calibrations
- PIC expertise for Root Cause Analysis



Contact us for more details!

Thank you for your attention!



Contact details



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