SPECIFICATION SHEET

Supply, installation and commissioning of *Wafer Dicing Line* for the ICFO, financed by FEDER Catalunya 2021 - 2027

FILE NUMBER: ICFO-2026-036

CLAUSE 1. Object of the contract

The purpose of this contract is the supply, installation and commissioning of a **Wafer Dicing Line** for the ICFO, financed by FEDER Catalunya 2021 ‐ 2027.

The types of items supplied are linked to the CPV (Common Public Procurement Vocabulary) **38000000-5** Laboratory, optical and precision equipment (except glasses).

CLAUSE 2. Needs to satisfy

PhotonChip is a platform project that will help bring photonic technologies, in particular integrated photonics and photonic chips, from scientific feasibility to prototype stage to be applied in, for instance, communications as 6G transceivers, sensors, quantum computing and technology platforms.

Once operational, PhotonChip will cover the whole photonic chip value chain (design, packaging, testing) and train new experts thanks to dedicated programs.

As part of the Institute of Photonic Sciences (ICFO), PhotonChip will use advanced technologies as quantum technologies for cybersecurity, virtual and augmented reality, artificial intelligence, and machine learning.

In the development of the project, ICFO needs to acquire a **Wafer Dicing Line**, to dice of wafers of Photonic Integrated Circuits (PIC) originating from front-end fabrication processes into chips, which will then be packaged within the ICFO Packaging Facility.

As such, the Wafer Dicing Line must comprise the following equipment units:

A. *Semi-automated dicing saw*, used to mechanically singulate wafers into individual dies by means of a diamond dicing blade.
B. *Semi-automated cleaning station*, designed to remove debris and impurities generated by the dicing process.

CLAUSE 3. Technical requirements

Technical proposal structure - minimum mandatory equipment characteristics

The minimum technical specifications for each piece of equipment in the dicing line are defined below.

A. Semi-Automated Dicing Saw.

The semi-automated dicing saw must be capable of processing wafers up to 12 inches in diameter. The system must comply with, at minimum the following specifications:

1. Chuck tables. The system must include two porous chuck tables, enabling processing with 12” dicing frames and 8” dicing frames.

2. Dual spindle configuration. The system must be equipped with two spindles to allow processing with two different blades.
    - 2.1. Each spindle must support a maximum rotational speed of at least 60,000 RPM.
    - 2.2. It must be compatible with both 2” and 3” dicing blades.
    - 2.3. It must support hub-mount and flange-mount blades.

3. Functionalities related with blade
    - *3.1.* Blade-breakage detection system
    - *3.2.* Non-contact blade-diameter measurement during dicing
    - *3.3.* Circular cutting capability for wafer-edge trimming

4. High performance dicing. In order to support high precision and performance dicing, the system must include:
    - 4.1. A high-magnification microscope
    - *4.2.* Closed-loop control on all motion axes
    - *4.3.* Ultrasonic capability for improved dicing quality.
    - *4.4.* A chuck table water curtain to enhance process cleanliness.

5. Automated functions. The system must offer the option to perform automatically the following functions:
    - *5.1.* Focus and light intensity control
    - *5.2.* Micro-Alignment using the high-magnification microscope*.*
    - *5.3.* Kerf-width measurement
    - *5.4.* Blade dressing
    - *5.5.* Automatic lens shutter with air-blast cleaning system

6. Additional system requirements.
    - *6.1.* Uninterruptible Power Supply (UPS)
    - *6.2.* Integrated ioniser for protection of ESD-sensitive components
    - *6.3.* Water flow-rate control
    - 6.4. Possibility of programming the dicing of different substrates mounted on the same tape frame.
    - 6.5. All the accessories required for machine startup and acceptance

B. *Semi-Automated Cleaning Station*

The semi-automated cleaning station must be capable of cleaning diced silicon or glass wafers up to 12 inches in diameter and must include at least the following:

1. 12” ceramic porous table, suitable for wafers mounted on 12” and 8” frames
2. Atomizing nozzle
3. Integrated ioniser for protection of ESD-sensitive components

Software requirements

1. The system must include the software required to manage all required functionalities described above and shall be supplied with a permanent (non-expiring) license.
2. The software shall be installed on the system.

Technical documentation or manuals to be delivered

A set of documentation shall be provided, covering the following topics:

- Comprehensive system user manuals for all the machines, including both hardware and software (where applicable) descriptions.

CLAUSE 4. Power distributions and safety.

The system shall include:

- Operation: 230V ±10%, 50 Hz (per UNE-EN 61010-1, Spanish adoption of IEC 61010-1)
- CE-certified power integration with overvoltage protection
- Electrostatic Discharge (ESD) protection mechanisms.
- Automatic shutdown and restart safety protocol
- The system will be fully protected against unexpected power cuts and, in that case, will be fully safe for the operators. A quick and easy turning on of the system has to be possible after a power cut.

CLAUSE 5. System layout and services

The proposal shall include a set of “system layout and services documentation”, containing the following information:

- System layout, including overall footprint, weight, drawings and description of the different system components.
- Installation and start-up requirements, including required utilities, service connections, and any applicable environmental specification.

CLAUSE 6. Transportation, installation, start-up and training

- Contract includes the installation and start-up of the system, including system checking, functional tests and the supply of all those elements necessary for its correct operation

- The proposal will include transportation to ICFO’s facilities including insurance and all export/import and customs duties.

- Any other customs or miscellaneous expenses, unexpected and not covered in the tender, which may arise until the equipment arrives at ICFO, must initially be borne by the Supplier and will be reimbursed by ICFO upon submission of supporting documentation proving the actual incurrence of such expenses.

- The machine will be placed in the designated location by ICFO. The contractor shall cover all costs, organization, and coordination related to the placement, including the provision of any required specialized equipment or vehicles, as well as any necessary component disassembly and reassembly for unloading and transportation inside the building, strictly following the route specified by ICFO.

- The contractor will be responsible for the removal and proper disposal of the packaging when the machine is delivered and unpacked, or its storage during the warranty period in case the original packaging needs to be kept.

Process qualification.

No Factory Acceptance Test (FAT) is required for the proposed system. The Site Acceptance Test (SAT) will be carried out at ICFO facilities. Final acceptance of the system will be granted upon successful completion of the following technical demonstrations:

a) Silicon Wafer Dicing: Dicing of silicon wafer into devices with dimensions to be mutually agreed.

b) Glass Wafer Dicing: Dicing of glass wafers into devices with dimensions to be mutually agreed.

CLAUSE 7. Warranty and Follow-on Support

- 1-year Full Warranty on all parts and components of the system irrespective of the manufacturer. The warranty will include the replacement of any faulty or damaged part(s) during normal use of the system, no matter the manufacturer of the component(s). It will cover any cost related with the disassembly, transportation, reparation and re-assembly of the damaged component(s), including all travelling and living costs of the required service engineer(s). An on-site repair, or a justified alternative to reduce the system down time to the minimum, will always be the first service option. A team of properly qualified and skilled service engineers will have to be available.
- System lifetime support.
- Spare parts will be available during, at least, 10 years after system supply.
- An estimation of the cost of a warranty extension or available support contract options after warranty period will be included

CLAUSE 8. Training

- System training for ICFO personnel shall be included in the proposal.
- The training shall ensure proper and safe operation of the system and shall cover basic and advanced functionalities, including process development, programming and automation features.
- The training program shall also provide an overview of basic maintenance procedures, covering routine preventive tasks and essential troubleshooting guidelines.

CLAUSE 9. Delivery and Installation Time

The machine should be delivered within **12 months starting from tender assignment.**

For the purpose of this tender, delivery time is defined as the period from the purchase order (PO) issuance until system delivery at ICFO facilities, including manufacturing, transportation, installation, and acceptance tests.

CLAUSE 10. Target price.

- The target price for the system is **560.000,00 €** (VAT excluded).
- Payment terms: The following payment schedule is proposed, divided into two milestones to ensure clarity and transparent project follow-up:

Milestone 1. A payment of **30%** of the contract price shall be released upon delivery and approval of the following items, subsequent to the kick-off meeting with ICFO personnel:

a) A complete set of engineering documentation. This shall include system drawings, detailed technical descriptions, operation manuals, and all constructive documentation for the system and its components, including optional items.
b) SAT Specification agreement. Detailed specification agreement, including but not limited to frame, tape, blade to be used, kerf quality.
c) Presentation and agreement of training plan, following technical discussions with ICFO personnel.

Milestone 1 shall be completed within 2 months after the Purchase Order.

Milestone 2. The remaining **70%** of the contract price shall be released upon:
a) Completion of the system installation at the designated site, and
b) Successful Site Acceptance Test (SAT), demonstrating full compliance with the technical requirements.

Castelldefels, on the date of its digital signature

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Optolectronics