ICFO

Finançat per la Unió Europea

Generalitat de Catalunya

SPECIFICATION SHEET

Supply, installation and commissioning of a *Photonics Polishing System* for the ICFO, financed by FEDER Catalunya 2021 - 2027

FILE NUMBER: ICFO-2026-026

CLAUSE 1. Object of the contract

The purpose of this contract is the supply, installation and commissioning of a **Photonics Polishing System** 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 the supply of a **Photonics Polishing System,** including Photonic Integrated Circuits (PIC) and fiber connectors. Optical-quality polishing of PIC edge facets is essential to ensure low-loss coupling. The system will also provide the capability to polish fiber connectors within the same platform, to repair connectors and perform connectorization of specialty-fiber pigtails.

CLAUSE 3. Technical requirements

Technical proposal structure - minimum mandatory equipment characteristics

The system shall integrate a polishing machine, all required fixtures for handling PICs of different dimensions and fiber-connectors, as well as a video inspection sub system enabling process control and verification.

The machine shall comply with, at minimum, the following requirements:

1. PIC size compatibility. It shall be capable of polishing PICs with widths ranging from 2mm to 50mm and thicknesses from 0.5 to 5mm, in angles ranging from 0 to 50 degrees.

2. Fiber connectors. It shall capable of polishing industry-standard connectors in UPC and APC geometries, up to 12 connectors.

3. Micron level control positioning and control during polishing operation.

4. It shall ensure angle repeatability of ± 0.3 degree.

5. Automated linear vertical axis, providing automatic feeding motion and polishing depth control, without removing the component from the fixture.

6. Allow in-line inspection of the polished facet quality, without removing the component from the fixture.

7. The system shall support polishing with water-based films. Slurry-based polishing processes are not acceptable.

The system must also include, at minimum, the following components:

8. Polishing machine equipped with 5-inch rotatory plate.

9. Fixture for single PIC polishing, supporting flexible size and automatic angle adjustment, according to specs in item 1.

10. Fixture for various PIC polishing (minimum 4 PICs), enabling simultaneous polishing at a fixed angle of 0º.

11. Fixtures for UPC connectors polishing, with a minimum capacity of 2 positions

12. Fixtures for FC/APC connectors polishing, with minimum capacity of 2 positions

13. Inspection equipment for polishing process monitoring, including side view and angle profile.

14. Inspection equipment for polishing process monitoring, including front view, parallelism and fiducials.

15. Polished surface inspection system, enabling real-time evaluation of the polished surface during the process and without removing the component from the polishing fixture.

16. Set of fixtures and polishing films required for initial machine setup and acceptation, covering glass, silicon and LiNbO3 PICs polishing and FC/APC connectors polishing.

Software requirements

1. PC with windows 11

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

3. Software shall allow taking measurements dimensions for polish deep measurement, polish angle measurement, automatic feeding adjustment

Technical documentation or manuals to be delivered

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

- Comprehensive system user manual, including both hardware and software descriptions.

CLAUSE 4. Power distributions and safety

The system shall include:

- Electrical Operation: 230V ±10%, 50 Hz (per UNE-EN 61010-1, Spanish adoption of IEC 61010-1)
- CE-certification

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, and detailed 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

- 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

Site Acceptance Test (SAT) will be required as part of the equipment delivery and acceptance process.
To demonstrate compliance with the specification, it shall include, at minimum, verification of relevant machine parameters and successful development and execution of the following polishing processes:

a) Glass PICs
b) Silicon PICs
c) LiNbO3 PICs
d) FC/APC ceramic connectors.

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.

CLAUSE 8. Training

- The contractor shall provide at least **one full day** of training to the equipment users, scheduled on a mutually agreed date, to ensure proper and safe operation of the system.

- The training shall also include an overview of basic maintenance procedures, covering routine preventive tasks and essential troubleshooting.

- Training will take place at the ICFO facilities.

CLAUSE 9. Delivery and Installation Time

The machine should be delivered within 4 **months starting from the formalization of the contract.**

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.

The purchase order will be issued upon contract formalization or within the immediately following days.

CLAUSE 10. Target price

- The target price for the system is 80.000 € (VAT excluded).

- Payment terms: Full payment will be made once the final receipt of supply, installation and commissioning is issued.

Castelldefels, on the date of its digital signature

Prof. Dr. Valerio Pruneri
Optolectronics