SPECIFICATION SHEET (PPT)

Supply, installation and commissioning of an *Epoxy Dispensing System* for the ICFO, financed by FEDER Catalunya 2021-2027

FILE NUMBER: ICFO-2026-078

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CLAUSE 1. Object of the contract

The object of this contract is the supply, installation and commissioning of an **Epoxy Dispensing System** for the ICFO, financed by FEDER Catalunya 2021-2027.

The items to be supplied are classified under the following CPV (Common Procurement Vocabulary):

- 38000000-5 Laboratory, optical and precision equipment (except glasses).

CLAUSE 2. Needs to satisfy

PhotonChip is a platform project that aims to bring photonic and integrated-photonics technologies from scientific feasibility to prototype stage, covering the photonic-chip value chain (design, packaging, testing).

Within this project, ICFO needs an **Epoxy Dispensing System** for its Photonics Packaging line, to be used for precision epoxy dispensing and underfill during the assembly of photonic and optoelectronic devices. The system will include a non-contact jet dispensing unit with a vision-guided robotic platform, able to dispense fluids accurately and repeatably on a wide range of substrates and geometries (optoelectronic packages and substrates up to 12-inch wafers), with flexibility in fluid types, volumes, droplet sizes and patterns.

CLAUSE 3. Technical requirements

Minimum mandatory equipment characteristics

The Epoxy Dispensing System shall provide, at minimum, the following capabilities and specifications:

3.1. The Epoxy Dispensing System shall be configured as follows:

a. Equipped with a non-contact jet dispensing head, a vision-guided robotic platform and a temperature-controlled vacuum substrate holder.
b. It shall be a flexible and modular benchtop platform, allowing future upgrades and configuration changes.
c. It shall support precision manual and automatic dispensing operations.
d. Designed for precision fluid dispensing and underfill applications in photonic and microelectronic packaging.

3.2. The equipment shall support dispensing a wide range of substrates and fluid materials:

a. Compatible with a wide range of substrate types, including optoelectronic packages such as gold-box butterfly housings, and flat substrates up to 12-inch wafer formats.
b. Capable of dispensing epoxies, underfill materials, pastes, sealants and similar fluids for optoelectronics packaging.
c. Support dot and line dispensing operations.
d. Designed for accurate dispensing in narrow spaces and over non-uniform surfaces.

3.3. The dispensing unit shall consist of a non-contact jet dispensing system capable of generating precise fluid droplets, and shall meet the following minimum requirements:

a. High-speed jet dispensing with a maximum dot dispensing frequency of at least 2,000 Hz.
b. Compatible with dispensable materials with viscosities from 50 to 2,000,000 mPa·s
c. Capable of dispensing small droplets, with a diameter of 120 µm or smaller

d. Dispensing pressure adjustable over a range covering, at least, 0.010 MPa to 0.500 MPa.
e. Adjustable nozzle temperature control system for optimization of dispensing performance with different materials, adjustable up to at least 70ºC.
f. Fluid feed unit compatible with standard syringe formats.
g. Support synchronized dispensing during robot movement.

3.4. The dispensing unit shall be supplied with all accessories required for system setup, commissioning and operation, including at a minimum:

a. Two different dispensing nozzles, gauges 31G and 38G.
b. Holders for 5 cc and 10 cc syringes.
c. Maintenance tools for installation and removal of the rod assembly, nozzle components, and fluid feed unit.
d. All fittings, adapters, and accessories required for operation of the dispensing system.

3.5. The system shall incorporate a precision dispensing robot and work area with synchronized control of the dispensing head, meeting the following minimum requirements and components:

a. High-precision 3-axis (XYZ) robotic dispensing platform.
b. Minimum working area of 300 × 300 mm.
c. Programmable travel speeds covering, at least, 5 mm/s to 400 mm/s.
d. Repetitive positioning accuracy of ±0.005 mm or better.
e. Heated vacuum chuck, with adjustable temperature control for substrate fixation and process stability.
f. Nozzle calibration station.

3.6. The system shall incorporate an integrated vision system and software platform providing all functionalities required for equipment operation, including:

a. Vision system comprising camera, optics and illumination.
b. Minimum working clearance of 30 mm between the vision system and the substrate surface.
c. Fiducial recognition and automatic alignment functions.
d. Height sensing capability for substrate height measurement and compensation of surface variations.
e. Automatic angular alignment correction to compensate for workpiece displacement and angular misalignment.
f. Post-dispensing measurement and inspection capabilities.
g. Communication with the dispensing system, enabling full control of dispensing parameters and process settings.
h. Programming of motion paths or dispensing patterns.
i. Data logging and process monitoring functions.

3.7. The system shall be delivered as a complete workstation, including:

a. PC and monitor.
b. A permanent, non-expiring software license.

CLAUSE 4. Power supply and safety

The system shall comply with the following requirements:

4.1. Electrical Supply: 230V ± 10%, 50 Hz.

4.2. Electrical safety: compliance with UNE-EN 61010-1 (Spanish adoption of EN 61010-1) or an equivalent standard providing an equivalent level of safety.

4.3. The system shall bear the CE marking.

4.4. Safety interlocks.

CLAUSE 5. Technical documentation

The tenderer shall include in its technical proposal the following documentation:

Technical documentation:

5.1. Datasheets, technical brochures or equivalent official manufacturer documentation demonstrating compliance with each minimum requirement of Clause 3.

- For each criterion of Annex 2 that the tenderer offers, the documentation or signed commitment required in Annex 2. Criteria not offered, or whose required documentation is not submitted by the tender deadline, score 0. Such documentation cannot be supplemented or replaced after the deadline. ICFO may only request clarification of evident material errors (e.g. typographical errors) that do not alter the content of the offer.

5.2. Comprehensive system user manual in English, including both hardware and software descriptions, routine servicing and troubleshooting.

System Layout and Services Documentation.

5.3. System layout, including overall footprint and height, weight, drawings and description of the different system components.

5.4. Installation and start-up requirements, including required utilities, service connections, and any applicable environmental specification.

CLAUSE 6. Transportation, installation, start-up

6.1. Transport and delivery

a. The contract includes the supply, transportation, installation and commissioning of the system at ICFO's facilities, as well as all components and consumables required for initial start-up, and any works or services necessary for its correct and full operation.

b. The contractor shall deliver the system to ICFO's facilities. Accordingly, the contractor shall bear all costs and risks associated with transport, export and import licences, customs clearance and duties, import taxes, and any other charges arising until the system is made available at ICFO's premises. The contractor shall take out and maintain adequate transport insurance covering the full replacement value of the system until the moment of formal reception by ICFO.

6.2. Installation and placement

a. The system shall be placed at the location designated by ICFO. The contractor shall cover all costs, organisation and coordination related to placement, including the provision of any specialised equipment or vehicles, and any necessary disassembly and reassembly of components required for building access or internal transportation, strictly following the route and access conditions specified by ICFO.

   Note: *The designated location has level, step-free access. Delivery shall be performed using a vehicle equipped with a loading ramp or liftgate, together with appropriate wheeled handling equipment. Any deviation from the agreed access route requires prior written authorisation from ICFO*.

6.3. Packaging management

a. The contractor shall be responsible for the removal and proper disposal of all packaging materials upon delivery and unpacking of the system, in compliance with Ley 7/2022, de 8 de abril, de residuos y suelos contaminados para una economía circular, and any applicable waste management regulations. Where the contractor determines that original packaging must be retained during the warranty period for potential return or re-shipment purposes, it shall notify ICFO in writing at the time of delivery. In such cases, the contractor shall store the packaging at its own cost and risk, unless ICFO agrees in writing to provide on-site storage space.

6.4. System qualification

a. Factory Acceptance Test (FAT; ICFO attendance not required) and Site Acceptance Test (SAT; carried out at ICFO's premises in the presence of ICFO technical staff) are required as part of the delivery and acceptance process.

b. It shall include, at minimum:

- Machine parameters and functionality verification, such as robot positioning accuracy, vision system operation, height sensor operation, jet dispenser performance, temperature control, etc. demonstrating compliance with the specification.

- Demonstration of epoxy droplet dispensing, confirming stable and repeatable operation within the performance limits and specifications of the supplied equipment. Epoxy and substrate will be provided by ICFO.

- The SAT shall include verification that every item offered under Annex 2 is delivered and operational.

c. Successful completion of the SAT shall trigger the formal Act of Reception (Acta de Recepción). ICFO shall issue the Acta de Recepción within one (1) month of SAT completion.

6.5. Protocol in the event of SAT failure and remediation deadlines.

a. Should the equipment fail any of the tests or verifications established in the SAT, the following protocol shall apply:

- Formal notification of failure (Day 0): ICFO shall notify the contractor in writing and through a verifiable channel of the deficient results obtained, specifying in detail the parameters that did not meet the required values and attaching the corresponding measurement reports.
- Corrective Action Plan (deadline: 5 working days from notification): the contractor shall submit to ICFO a written corrective Action Plan, identifying the root cause of the non-compliance, the proposed corrective measures, and an implementation schedule not exceeding 30 calendar days from the date of failure notification.
- Re-execution of the SAT (deadline: maximum 30 calendar days from notification): once the corrective measures have been implemented, the contractor shall repeat the SAT in the presence of ICFO technical staff, within the aforementioned deadline. All costs associated with this repetition shall be borne entirely by the contractor.

CLAUSE 7. Warranty and Follow-on Support

7.1. 1-year Full Warranty covering all parts and components of the system irrespective of the original manufacturer of each component. The warranty period shall begin to run from the date of the formal Act of Reception (Acta de Recepción) referred to in Clause 6. The warranty shall cover, at a minimum and at no additional cost to ICFO:

a. Replacement or repair of any part or component that fails or is found defective during normal operation.
b. All costs of diagnosis, disassembly, repair or replacement, reassembly, and recommissioning, including consumables required for the repair.
c. Travel, accommodation and subsistence costs of all service engineers required for on-site intervention.
d. Shipping, insurance and handling costs for any component transported between ICFO and the contractor's facilities.

7.2. Technical support and spare parts: for at least ten (10) years from the date of the Acta de Recepción, the contractor shall guarantee the availability of technical assistance and spare parts. A qualified technical specialist shall respond to each technical request within 5 working days.

7.3. The tenderer shall attach, for information only, an estimate of the cost of a warranty extension or support contract. This estimate is not scored, does not bind ICFO, and any subsequent contracting shall comply with applicable procurement rules.

CLAUSE 8. Training

8.1. A minimum of 1 day (8 hours) of mandatory training for up to 3 ICFO staff shall be included in the contract price, at ICFO's facilities, on a mutually agreed date with ICFO within the execution period, in English or Spanish and with training materials.

8.2. 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.

8.3. The training program shall also provide an overview of basic maintenance procedures, covering routine preventive tasks and essential troubleshooting guidelines.

CLAUSE 9. Execution Period

9.1. The maximum execution period of the contract is **THIRTEEN (13) WEEKS**, counted from the day following the formalisation of the contract.

9.2. The period covers all phases from manufacturing to the successful completion of the SAT (Clause 6.4), including training (Clause 8). Delays attributable to ICFO shall not be counted.

CLAUSE 10. Tender budget

10.1. The estimated value of the contract, VAT excluded, is EUR **95.000,00**.

10.2. The tender budget (presupuesto base de licitación), VAT included, is EUR 114.950,00 (VAT at 21 %: EUR 19.950,00). Tenders shall be expressed in euros. Tenders whose price, VAT excluded, exceeds EUR 95.000,00 shall be excluded.

10.3. The price includes all items, services and costs required by this Specification. No price revision applies.

10.4. Payment shall be made in a single instalment within thirty (30) calendar days from the later of (i) signature of the Acta de Recepción and (ii) receipt of a correct invoice. The invoice shall be issued after signature of the Acta de Recepción.

Castelldefels, on the date of its digital signature

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