

SPECIFICATION SHEET

Supply, installation and commissioning of a Thermal Stream System for the ICFO, financed by FEDER Catalunya 2021-2027

FILE NUMBER: ICFO-2026-058

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CLAUSE 1. Object of the contract

The object of this contract is the supply, installation and commissioning of a **“Thermal Stream System”** for ICFO, financed by FEDER Catalunya 2021-2027.

The items to be supplied are classified under the following 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 **Thermal Stream System** to perform temperature stress testing of the devices under development.

The Thermal Stream System is a test instrument that delivers a controlled stream of air to the device under test. It enables rapid temperature cycling (of the order of seconds or few minutes) over a range from -80 to +225 °C. This allows the evaluation of the device performance and reliability under thermal stress conditions.

CLAUSE 3. Technical requirements

Technical proposal structure - minimum mandatory equipment characteristics

The Thermal Stream System shall provide, at minimum, the following capabilities:

1. Programmable temperature profiles, allowing thermal cycling and thermal shock testing.
 - a. Temperature Range: -80°C to +225°C, with an accuracy of $\pm 1^\circ\text{C}$.
 - b. Transition Rate: from -55 to +125°C and 125 to -55°C within 10 seconds.
 - c. Airflow capacity: up to at least 24 SCFM.
2. Transportable design.
3. It shall include a flexible thermal head for directing the air stream onto the Device Under Test (*DUT*), including:
 - a. Automatic vertical (up/down) movement.
 - b. Exhaust airflow maintained at near-ambient temperature, ensuring safe operation and preventing frost formation within the test area.

4. Closed-loop DUT temperature control system.
 - a. Sensor interface for at least two thermocouples and one RTD
5. The system shall include an integrated chiller, requiring no external cooling unit and no consumption of liquid nitrogen or liquid CO₂.
6. Testing enclosure, including:
 - a. A glass enclosure suitable for DUT 13 cm size.
 - b. Minimum 3 transparent shrouds of different dimensions.
 - c. Minimum 3 sheets of insulation foam.
7. Modular design allowing integration of additional or custom testing enclosures (e.g. specific sample geometry and dimension) as optional or future upgrades.

Software requirements

1. The system must include the software required to manage all required functionalities described above, including process control (e.g. heating and cooling ramps, air flow), as well as monitoring and data logging.
2. The software shall be installed on the system, and shall be supplied with a permanent (non-expiring) license.

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, routine servicing and troubleshooting.
- Datasheets, technical brochures, or equivalent official manufacturer documentation describing the proposed equipment, demonstrating compliance with each of the minimum mandatory technical requirements set out in Clause 3 of this Technical Specification Sheet. Failure to provide sufficient documentation to verify compliance with any minimum mandatory requirement may result in the exclusion of the tender.
 - Automatic evaluation criteria: The tenderer shall only be required to provide supporting documentation for those automatically evaluable criteria set out in Annex 2 of the Administrative Clauses that ICFO expressly identifies as requiring documentary substantiation, and only in respect of the specific improvements that the tenderer chooses to offer. No documentation shall be required for criteria or options that the tenderer does not offer. Documentation not submitted within the tender deadline for a criterion that the tenderer has chosen to offer cannot be supplemented at a later stage, and the corresponding criterion will be scored as not offered.

CLAUSE 4. Power distributions and safety

The system shall include:

- Electrical Operation: 230V $\pm 10\%$, 50 Hz, in compliance with UNE-EN 61010-1 (Spanish adoption of IEC 61010-1), or equivalent standard, ensuring the same level of safety and performance.
- CE-certification.
- Safety interlocks.

CLAUSE 5. System layout and services

The tenderer shall include in its technical proposal a complete "System Layout and Services Documentation" package, containing the following information:

- System layout, including overall footprint and height, 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.

- 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.
- 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.
- 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 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.

- 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 suelo contaminado 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.

Process qualification

A Site Acceptance Test (SAT) shall be performed at ICFO's facilities following installation and commissioning of the system:

Final acceptance shall be conditional upon the successful completion of all of the following

- a) Verification of key system parameters as well as other relevant specifications to demonstrate compliance with the technical requirements.

Protocol in the event of SAT failure and remediation deadlines.

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

1. *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.*
2. *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.*
3. *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

- 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 acceptance record (Acta de Recepción) issued by ICFO within a maximum period of one (1) month from the date of SAT completion. The warranty shall cover, at a minimum and at no additional cost to ICFO.
 - Replacement or repair of any part or component that fails or is found defective during normal operation, regardless of the component's manufacturer.

- All costs of diagnosis, disassembly, repair or replacement, reassembly, and recommissioning, including consumables required for the repair.
 - Travel, accommodation and subsistence costs of all service engineers required for on-site intervention.
 - Shipping, insurance and handling costs for any component transported between ICFO and the contractor's facilities.
- System maintenance support available during, at least, 10 years, including access to technical assistance. The supplier shall provide feedback from a qualified technical specialist within five (5) working days.
 - Spare parts will be available during, at least, ten (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 in the proposal.

CLAUSE 8. Training

- A minimum of 1 day of mandatory training for ICFO staff shall be included, at the ICFO facilities, scheduled on a mutually agreed date.
- The training shall ensure proper and safe operation of the system by designated equipment operators and engineers.
- 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 maximum execution period of the contract shall be **TWO (2) MONTHS**, counted from the day following the date of its formalisation.
- Within this period, the supplier must complete the manufacturing, transportation, delivery, installation, integration, commissioning of the system, and the execution of the Site Acceptance Tests (SAT). The delivery time shall therefore be understood as the full period required to complete all contractual obligations up to the successful acceptance of the equipment at ICFO facilities.
- Successful completion of the SAT shall trigger formal acceptance pursuant to Clause 6, with the warranty period under Clause 7 commencing from the date of the **Acta de Recepción**. Within thirty (30) days following said record, ICFO shall proceed with the final settlement of the contract and payment of any outstanding balance.

CLAUSE 10. Tender budget

- The maximum tender budget (Presupuesto Base de Licitación) for the supply, installation and commissioning of the system is **49.000,00 €** (VAT excluded).

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- Payment terms: full payment will be made in a single instalment, once the final reception certificate (Acta de Recepción) covering supply, installation and commissioning is issued, within thirty (30) days following said record.

Castelldefels, on the date of its digital signature

Prof. Dr. Valerio Pruneri
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