

SPECIFICATION SHEET

Supply, installation and commissioning of a Microwave Plasma Asher for the Pilot Line PIXEurope at ICFO

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CLAUSE 1. Object of the Contract

The object of this contract is the supply, installation and commissioning of a **Microwave Plasma Asher** for the Pilot Line PIXEurope at ICFO.

The supplies covered by this contract fall under CPV (Common Public Procurement Vocabulary) code 38000000-5 – Laboratory, optical and precision equipment (excluding glasses).

CLAUSE 2. Needs to Satisfy

Within the PIXEurope project, the production of micro- and nano-devices is planned, a process that frequently requires the removal of photoresist, the cleaning of samples and the activation of surfaces. To meet this need, the project requires a microwave plasma asher.

Samples processed at ICFO for the PIXEurope project have a diameter of up to 200 mm. The system must be compatible with, and able to accommodate, samples of this size.

CLAUSE 3. Technical Requirements

Technical proposal structure

The technical proposal must follow the structure of this document as closely as possible, in order to facilitate its evaluation. Any optional accessories not included in the base proposal must be described in a separate section.

1. Machine / Process Overview

The plasma asher system will be used to remove photoresist, clean samples and activate surfaces. Therefore, it must be able to perform:

- Photo resist ashing (stripping) after dry etching processes like RIE or sputter etching.
- Descum prior to lift off metallization process
- Surface cleaning as part of preparation of the surface before processing or after the photolithographic process
- Removal of organic passivation layers and resists.

All the following technical specifications should have already been demonstrated based on results obtained with the system. Data from these results should be included in the technical presentation of the system.

2. Process Chamber and Sample Loading

- a- The process chamber must be made of quartz.
- b- The chamber rear wall should be made of aluminium.
- c- The chamber vacuum seals should be made of silicon elastomer or any material allowing a correct and sufficient vacuum sealing and that can withstand the plasma processes without degrading.
- d- The chamber door should be made of aluminium, resistant to plasma processes, and must integrate a quartz viewing window equipped with UV and microwave shield for protection.
- e- The plasma asher system must have a manual door opening system, allowing for an easy introduction of samples.

- f- The chamber inner size diameter must be 300 mm, or larger, to accommodate 200 mm wafers while providing sufficient radial clearance to minimize chamber-wall edge effects and enable uniform plasma generation, gas distribution, and pumping across the wafer surface.
- g- The system must be able to accommodate a quartz boat for 8-inch wafers. The quartz boat and a handling fork to manipulate the boat must be provided.
- h- A grid plate for small samples loading and a horizontal loading plate of aluminium for 8-inch wafers must be provided.
- i- A Faraday cage made of perforated aluminium sheet metal, of cylindrical shape and electrically isolated but mechanically fixed to the rear chamber wall must be included. It must be suitable for 8-inch wafers.

3. Vacuum System

- a- The system base pressure must be lower than 0.1 mbar.
- b- The system must be able to operate in a pressure lower than 2 mbar.
- c- The total pump down time of the chamber must not be longer than 2 min.
- d- The system must be equipped with a vacuum gauge measuring a range of 0.010 to 10 mbar with a capacitance manometer.
- e- The vacuum pump shall be a dry-running vacuum pump with a pumping capacity of 78 m³/h, or more. The pump shall be equipped with an appropriate exhaust filtration system suitable for dry-pump operation.
- f- The vacuum pump must have a motor protection switch and CEE-electrical connector (3-phase) with 1 m flexible metal tube with fittings, filled with PFPE-fluid or an equivalent lubricant offering comparable chemical inertness and vacuum performance, and shall operate at 400V, 50/60 Hz, 3-phase, N, PE.
- g- Vacuum valve should be of DN 40 KF Elbow type, or equivalent.

4. Gas Supply and Control

- a- The plasma asher will have two gas channels and each channel will include a solenoid valve with a digital mass flow controller, and an orbital-welded stainless steel tubing with 1/4" connections.
- b- The system must have 2 separate gas lines with a MFC of minimum 200 sccm, calibrated for nitrogen gas.
- c- The system must provide a homogeneous distribution of the process gas inside the chamber.
- d- The software service menu must include a specific gas correction factor.

5. Microwave Generator and Power Supply

- a- The system must produce a plasma in the GHz frequency range.
- b- The system must provide a plasma power of at least 600 Watt with the possibility to adjust it continuously in the full range.

Note: The maximum controlled power value offered above this minimum will be scored under the award criterion «Maximum controlled power value» (Catalan: «Valor de potència màxima controlada»; Spanish: «Valor de potencia máxima controlada») — up to 5 points — as set out in the Award Criteria Annex («Anexo de criterios d'adjudicació» / «Anexo de criterios de adjudicación») to this tender.

- c- The system must have an air-cooled magnetron.

6. Spare Parts

- a- Spare fuse kit (where applicable).
- b- Spare part kit.
- c- O-Ring spares kit.

CLAUSE 4. Power Distribution and Safety

- The system must be configured for the EU (Spain) power grid (voltage, sockets, etc.) and must be CE marked.
- The system must be fully protected against unexpected power cuts and must remain fully safe for operators in such an event. The system must be capable of being restarted quickly and easily following a power cut.
- Component wiring must be routed to a centralized power distribution panel.
- EMO (Emergency Machine Off) protection must be provided.
- Appropriate hardware and software safety interlocks must be implemented, together with extended error diagnostics.
- The system must incorporate a light-tower system-status display (red/yellow/green).

CLAUSE 5. System Layout, Control and Documentation

- The dimensions of each system's body (height × width × depth) must not exceed 2.0 m × 1 m × 1 m, in order to be accommodated within ICFO's laboratories.
- The system must include hardware comprising a PC-based system controller with a monitor, a graphical user interface, and Ethernet, USB and RS232 interfaces.
- The system must include software comprising a real-time operating system, manual and automatic control via the user interface, user password protection, a multiple-recipe list (10 recipes, or more), a warning/error message dialogue, and software and hardware safety interlocks.
- The system must be able to monitor optical plasma intensity, allow real-time monitoring of process data, and provide the option to export such data.
- The system must include all electrical lines, process gas lines, venting lines, compressed dry air lines, and vacuum and exhaust lines, together with the corresponding connections necessary for its proper operation.
- The proposal must include a complete set of pictures, drawings and layouts of the system, including dimensions and the location and details of its various components.
- The proposal **must include full installation and start-up requirements** (unpacking of all system components; assembly; pumping; system run-up), clearly specifying, for the specific configuration of the offered system, connection types, tubing materials, pressures, flows, etc. During installation, instructions on the proper procedures for operating and maintaining the system must be provided
- A complete set of documentation must be delivered in English, covering the following topics:

- A complete set of manuals, drawings, schematics and layouts relating to system assembly and configuration (mechanical assembly, vacuum system layout, electrical schematics, interconnection of system modules, etc.).
- A complete system user manual, including routine servicing, troubleshooting and basic repairs
- A list of system spare parts, specifying quantity, manufacturer, part number, etc.
- All of the above documentation must be supplied in English, in both electronic format (CD/DVD) and paper copy.
- Where the system incorporates refurbished optional items, these must be explicitly identified in the proposal. Where possible, the refurbishment process undergone by each item must also be detailed.

CLAUSE 6. Transportation, Installation and Start-up

- The proposal must include transportation to ICFO's facilities, including insurance and all export/import and customs duties. **DAP incoterm will apply.**
- The machine will be placed at the location designated by ICFO. The contract winner shall be responsible for:
(i) all costs, organisation and coordination related to the placement of the machine, including specialised equipment or vehicles and any necessary disassembly/reassembly; (ii) taking accurate measurements of the transportation route outside and inside the ICFO building and planning in advance any required disassembly/reassembly; and (iii) checking the suitability of the selected location, including compatibility with existing laboratory systems and the mobility of users.
- Installation and start-up of the system must be carried out, including system checks, functional tests and process qualification.
- The contract winner shall be responsible for the removal and proper disposal of packaging once the machine has been delivered and unpacked, or for its storage during the warranty period, should the original packaging need to be retained.

Process qualification

- A checklist of tests will be carried out by the supplier's service engineer to confirm calibration and performance in accordance with specifications at the conclusion of the installation.

CLAUSE 7. Warranty and Follow-on Support

- **1-year Full Warranty** on all parts and components of the system, irrespective of manufacturer. The warranty covers the replacement of any faulty or damaged part(s) arising during normal use of the system, and all costs relating to the disassembly, transportation, repair and reassembly of the damaged component(s), including all travel and subsistence costs of the required service engineer(s).
 - The warranty period shall start from the date of signature of the formal acceptance certificate (*Acta de Recepción*) issued by ICFO upon successful completion of the Site Acceptance Test (SAT).
- System lifetime support:
 - Technical support via phone/email response within 3 hours of notification.

- On-site response time by a qualified field service engineer within maximum 10 business days) following confirmation of a critical system breakdown.
 - Guaranteed availability and supply of original spare parts for a minimum of 10 years post-installation. Spare parts shall be dispatched within 10 working days upon order placement.
- An estimate of the cost of a warranty extension or of the support contract options available after the warranty period must be included in the proposal.

CLAUSE 8. Training

- System training for ICFO personnel must be included in the proposal. The proposal must specify the number of training days and an approximate schedule. Training must cover both system operation and process use for ICFO users at ICFO's facilities, as well as specific maintenance and advanced service training for ICFO laboratory technicians.

CLAUSE 9. Delivery and Installation Time

- The maximum execution period of the contract shall be **TWELVE (12) WEEKS** 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.

CLAUSE 10. Tender Budget

- The tender budget (maximum bid price) for the supply installation and commissioning of the system is **ONE HUNDRED AND FIFTY THOUSAND EUROS (150.000,00 €)**, VAT excluded.
- Upon contract award, the contractor may choose between the following two payment structures:
 - Option A: Phased Payments (with Advance Guarantee)
 - 30% Advance Payment (Pago a cuenta): Upon official order placement for preparatory works. *Condition:* The contractor must provide a financial guarantee/bond equivalent to the advanced amount. This payment does not imply compliance or final acceptance.
 - 70% Final Payment: Upon delivery, commissioning, training, and formal signing of the Acceptance Report (*Acta de Recepció*).
 - Option B: Single Final Payment
 - 100% Total Payment: Disbursed in a single payment after full delivery, commissioning, training, and the formal signing of the Acceptance Report (*Acta de Recepció*).

CLAUSE 11. Environmental Clause

It is hereby stated that, in compliance with the provisions of the Recovery Plan, Regulation (EU) 2021/241 of 12 February 2021 establishing the Recovery and Resilience Facility, and its implementing regulations, in particular Commission Communication (2021/C58/01) Technical guidance on the application of the principle of “do no significant harm”, as well as the requirements of the Council Implementing Decision concerning the approval of the assessment of Spain's Recovery and Resilience Facility (RDF), all financed actions carried out under this contract must respect the principle of not causing significant harm to the environment (the “Do No Significant Harm” principle). This includes compliance with the specific conditions set out in component 17, measure I1, under which this contract falls. During the execution of the actions covered by the contract, no significant damage will be caused to the environment, in accordance with Article 17 of Regulation (EU) 2020/852.

The activities carried out will not cause direct environmental impacts, nor will they have primary indirect impacts throughout their life cycle, understood as those that may materialize once the activity has been completed.

The activities carried out by the successful bidder under this contract will not generate waste that, in its long-term disposal, could cause environmental damage, as this is one of the situations excluded from funding by the Recovery, Transformation and Resilience Plan, in accordance with the Technical Guidance on the application of the principle of “not causing significant harm” under the Regulation on the Recovery and Resilience Facility (2021/C 58/01), the Council's Proposal for an Implementing Decision on the approval of the assessment of Spain's recovery and resilience plan, and its annex. The activities carried out by the successful bidder will be adapted, where appropriate, to the characteristics set for the measurement and sub-measure of the assigned component, and reflected in the Recovery, Transformation and Resilience Plan.

The activities carried out will comply with all applicable environmental regulations in force.

For the transport, installation, and commissioning of the equipment covered by this contract, the contractor will implement waste minimization measures and, should any waste be generated, will be responsible for its collection, preparation for reuse, recovery, or recycling, or appropriate treatment.

Methods for monitoring and controlling compliance with the conditions

With regard to compliance with environmental and social requirements, the contractor remains obligated to:

- The contractor must sign, before the contract is formalized, the declaration of commitment regarding the implementation of actions under the Recovery, Transformation, and Resilience Plan (RTRP) and compliance with the principle of not causing significant harm to the environment, included as Annex of the Special Administrative Clauses.
- Issue a manual detailing the dismantling instructions for the equipment, including the reuse, recovery, or recycling operations, or appropriate treatment, including the disposal of fluids and selective treatment, applicable to each of the materials or parts that comprise it. The manual must include a table summarizing, expressed as a percentage by weight, the expected fate of the materials that make up the equipment at the end of its useful life, according to the following options: reuse (including recovery and recycling), energy recovery, and rejection/disposal.
- The contractor shall comply with the waste minimisation and management obligations set out above in this Clause 11.

Castelldefels, on the date of its digital signature

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