SPECIFICATION SHEET

Supply, installation and starting-up of a metal and carbon coater system for electron microscopy for the Pilot Line PIXEurope at ICFO

FILE NUMBER: ICFO-2026-023

Contents

CLAUSE 1. Object of the contract

The purpose of this contract is the supply, installation and commissioning of a “Supply, installation and starting-up of a metal and carbon coater system for electron microscopy for the Pilot Line PIXEurope at ICFO for ICFO’s laboratory.

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

Metal or carbon coating is used to mitigate charging effects in Scanning Electron Microscopy (SEM). Samples, such as insulators (typically glass, polymers,…) accumulate negative charge on their surface provoking charging effect and distortion of the SEM images. A layer of few nanometers deposited by the considered coater which is conductive, typically a metal or a carbon film, conserve the topography while provide a conductive path for electron to evacuate from the surface.

The system will be used as a metal / carbon coater system for the following applications:
- Uncharging thin layer on samples prior to SEM
- Uncharging thin layer on samples prior to EDS analysis
- Uncharging thin layer on samples prior to Focused Ion Beam lithography

Carbon coating is necessary for EDS analysis as a metal layer would introduce a parasitic signal at the metal XRay line energy in the EDS spectrum of the sample. Carbon, on the other side, is always present in the spectra and does not compromise the EDS analysis.

Samples treated at ICFO for the PIXEurope project are with a size up to 200mm diameter. The system must be compatible for to this size.

CLAUSE 3. Technical requirements

Technical proposal structure

The proposal has to follow as much as possible the structure of this technical requirements document to facilitate evaluation. Any optional accessories not included in the proposal will have to be put in a separate section, and not mixed with the included items.

Machine / Process overview

The system must be equipped a vacuum chamber accommodating samples up to 200mm in diameter and a metal sputter system to deposit thin metal films on the samples surface.
All the following technical specification should have already been proven by results obtained with the system. These data should be included into the technical presentation of the system.

1. Chamber
   a. The system will be equipped with a chamber that can be vacuum pumped, with a material such as metal or glass ant that must be implosion proofed.
   b. The chamber must accommodate samples with size up to 200 mm in diameter.

c. The chamber must have a liner or must be unmountable easily to proceed with its cleaning by chemical or mechanical action.

2. Sample handling

a. The system must include a metal stage that will be used to mount samples from small size of few mms x mms up to 200mm in diameter.
b. The metal stage must be able to rotate in order to get a more uniform deposition, compared to static stage.

3. Metal sputtering

a. The system must be able to deposit a thin metal film on the sample surface by target sputtering.
b. The thin metal film must be uniform in thickness within the 200 mm diameter sample area. To keep uniformity, the system can include more than one target mounted on the system contemporarily.
c. The metal available for sputter on this system must include Cr, Au/Pd, Pt and Ir.
d. Metal targets of Cr must be included, with a number of each one that corresponds to the number of different available target sites on the system.

4. Operation control

a. The system must have a touchscreen that allows to edit and run recipes to perform the deposition. It will be possible to store predefined recipes for standard protocols, and customizable recipes for tailored applications.
b. The graphic interface must allow to view the last runs and reminders for periodical maintenance.
c. The system must include a Film Thickness Monitor (FTM) for precise coating deposition control

5. Vacuum system

a. A fully safety interlocked high vacuum (HV) system to pump the deposition chamber. The base pressure of the system must reach 5 x 10^{-5} mbar, or lower.
b. Turbomolecular pump (TMP) to efficiently keep the HV
c. Dry rotary pump to back up the TMP

6. Carbon coating

a. The system should allow carbon coating for elemental analysis and TEM grids. If the main system that is proposed for metal sputtering of samples up to 200 mm diameter is not able to perform such a carbon evaporation deposition it is acceptable that the proposal includes a second optional system for sample sizes of up to 50mm diameter.
b. If an optional second system is proposed, it must follow the same specifications that are required for the main large system, except for the size, including vacuum level (with TMP), planetary stage, noble metal sputtering capability, FTM.

c. Carbon coating must be available by Carbon rod source or by carbon string/fibre.
d. For the carbon rob source, the tools to produce the carbon rod tip must be provided with the system
e. If the system needs a special carbon fibre mounting head in order to perform carbon fibre deposition then it must be provided too.
f. The system must include glow discharge treatment of the sample prior to evaporation, in order to modify its surface property by plasma.
g. The system must include a holder for 4 stubs, at least. The system must also include a variable angle rotary planetary stage.
h. The system must include a spare vacuum chamber so that maintenance of cleaning the chamber can be performed without stopping the working condition of the system.

CLAUSE 4. Power distributions and safety

- The system should be configured for EU (Spain) power grid (voltage, sockets, etc.) and be CE marked.
- 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.
- Component wiring routed to a centralized power distribution panel.
- EMO protection.
- Appropriate hardware and software safety interlocks. Extended error diagnostics.
- 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 will include a complete set of pictures, drawings and layouts of the system, including dimensions, location and details of the different components.
- The proposal **will include full installation and start-up requirements (Unpack all system components; Assembly; Pump; Run system to helium liquid production ratio; During the installation process, instruction should be provided on proper procedures for operation and maintenance of the system)**, clearly specifying connection type, tubing materials, pressures, flows, etc, for the specific configuration of the offered system.
- A set of documentation should be delivered in English including the following topics:
    - Complete set of manuals, drawings, schematics and layouts about system assembly and configuration (mechanical assembly, vacuum system layouts, electrical schematics, system modules interconnection, etc)
    - Complete system user manual, including routine servicing, troubleshooting and basic repairs
    - System components spare list, specifying quantity, manufacturer, part number, etc
    - All the above documentation will be supplied in English, in electronic format (CD/DVD) and in paper copy.
    - In case the system hosts refurbished optional items, they should be explicitly specified in the proposal. When possible, it should be detailed which refurbishment process they have been through.

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

- The proposal will include transportation to ICFO's facilities including insurance and all export/import and customs duties. **DAP incoterm will apply.**
- The machine will be placed in the designated location by ICFO. The contract winner 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 machine will be equipped with its own wheels to facilitate transportation and with leveling pads to ensure a stable and properly leveled position once installed.

- Depending on the size, machine crate may need to be disassembled outside ICFO building. The contract winner will be responsible for taking accurate measurements of the transportation route outside and inside ICFO and plan in advance any required component dis-assembly and re-assembly. The contract winner will be responsible for checking the selected location and for taking any required measurements to guarantee the suitability of it for the offered system. The compatibility with the operation of the systems already installed in the lab and the mobility of users will have to be guaranteed as well.
- Installation and start-up of the system, including system checking, functional tests and process qualification
- The contract winner 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

The flowing specifications will be demonstrated at the factory before shipment and at the side at the installation:

- Deposition of 15nm of Cr on 200 mm diameter Si wafer.
- Deposition of 15nm of Carbon by C rod source on a 2cm x 2cm glass slide.
- Deposition of 15nm of Carbon by C fibre source on a 2cm x 2cm glass slide.

CLAUSE 7. Warranty and Follow-on Support

- **3-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:
- By phone and e-mail with a response within 3 hours, during business hours 8:30–17:30.
- Emergency on-site engineer dispatch after a system breakdown: within 10 working days hours or less after initial response and after possible remote diagnose

- Spare parts will be available during, at least, 10 years after system supply and, in case of failure, will be delivered within 10 working days
- 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. The minimum number of training days will be 1. The contractist must specify the number of training days and the approximate schedule. Training will cover both system operation and process use for ICFO users at ICFO facilities, as well as specific maintenance and advanced service training for ICFO lab technicians.

CLAUSE 9. Delivery and Installation Time

The machine should be delivered within **2 months starting from the date indicated in the contract, or from the date of its formalization if a specific start date is not indicated.**

For the purpose of this tender, delivery time is defined as the period from the beginning of the contract until system delivery at ICFO facilities, including manufacturing, transportation, installation, and acceptance tests.

Installations record

- Such a system must have been fabricated at least 5 times by the same provider with a proven record of installation. The record list should be provided upon request.
- For these systems, compliance with the specifications set out in paragraph “Process qualification” (clause 6) must be demonstrated.

CLAUSE 10. Target price

- The target price for the system is 115.000,00 € (VAT excluded).
- Payment terms:
  - Payment on order - 30% total price. This payment is optional for the contractor, but in case the contractor requests a payment of 30% of the contract, he will have to constitute a guarantee for an amount equivalent to the amount requested for the advance. The payment of this amount does not imply conformity in the equipment, is an advance payment that the contractor must return in the event of non-compliance or deficient compliance.
  - Payment on delivery, commissioning and training - 70% total price

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.

- For the transport, installation, and commissioning of the equipment covered by the contract, the contractor will implement waste minimization measures and, should any waste be generated, will be responsible for its removal and management.

Castelldefels, on the date of its digital signature

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