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# Introduction

## Purpose

This Requirements Specification Document (RSD) lists the technical requirements and constraints on the product being purchased for department 97 of the ELI Beamlines project.

## Scope

The RSD contains all of the technical requirements: functional, performance and delivery, safety and quality requirements for the following product *(tender code TP22\_018)*: ***Ion Sputter*** ***Coater*** *(****Sputter coating system****)*.

The Sputter coating system is the standalone technology and is foreseen to be used in the depositing of particles on the surface of the structures:

* For thin film applications that allow consecutive metal layers to be sputtered without the need to break vacuum;
* Deposit metals on the surface of example structures, related, such as thin target substrate, micro-targets and nano-targets;
* Other applications related not only to targets.

The system will be placed at the ELI Beamlines facility in LB 2.38 and is registered in the PBS software under the following PBS code: *W.TGT.ISC.1*.

This product is a product **Category A** according to the ELI Beamlines RSD categories of products. The category A is an Off-the-shelf Product without the necessity of modifications and the necessity to be subjected to a verification program (review of design, inspection and testing) for ELI applications by the actual project specifications. All verification activities performed by a supplier shall be executed in accordance with the supplier’s plan of outgoing inspection and tests. Internal Acceptance Procedure of the product Category A shall be established and applied before the product implementation (operation phase).

## Terms, Definitions and Abbreviations

For the purpose of this document, the following abbreviated terms are applied:

| **Abbreviation** | **Meaning** |
| --- | --- |
| CA | Contracting Authority (Institute of Physics CAS) |
| ELI | Extreme Light Infrastructure |
| FEG-SEM | Field Emission Gun – Scanning Electron Microscope |
| RSD | Requirements Specification Document |

## References to standards

If this document includes references to standards or standardized/standardizing technical documents, the CA allows/permits also another equivalent solution to be offered.

# Functional, Performance and Design requirements

## General technical requirements

REQ-034985/A

The Supplier shall provide the turbomolecular vacuum pump for gaining the necessary vacuum level for sputter coating deposition processes of at least 5x10-5 mbar. The turbo molecular vacuum pump shall be air-cooled, mounted internally and shall have the minimal performance of 70 L/s. The primary pump shall be oil-free backing pump.

REQ-034986/A

The Supplier shall provide the sputter coating system for thin-film applications FEG-SEM.

REQ-034987/A

The Sputter coating system shall be capable to handle and coat on the substrates for large samples up to 200 mm (8’’) in diameter or multiple small samples.

REQ-034988/A

The Sputter coating system shall have the interface, capable of forming the recipes for automatic deposition.

REQ-034989/A

The Sputter coating system shall be compatible with the clean-room environment of class 7 according to ČSN EN ISO 14644 (or equivalent, e.g. EN ISO 14644) or cleaner.

REQ-034990/A

The Sputter coating system shall have the following ranges of the sputter deposition current: for single target 1-150 mA and for all targets 60-420 mA or better.

REQ-034991/A

The Sputter coating system shall be portable for appropriate use on the desk.

REQ-034992/A

The Supplier shall provide the Sputter coating system with triple target sputter head.

REQ-034993/A

The Sputter coating system shall have an option of film thickness monitoring.

REQ-034994/A

The Sputter coating system shall be equipped with visual status multi-colour indicator, which shall show at least the following states: initialization, process running, idle, coating in process, process completed and process ended in the fault condition.

REQ-034995/A

The Supplier shall provide the Sputter coating system with process gas argon, 99,999% Nominal 5 psi.

# Environmental requirements

REQ-034996/A

The Supplier shall provide the cleaning method to clean the Sputter coating system without degrading its properties and to avoid contamination of clean space (see REQ-035000/A).

*NOTE: The cleaning methods may use high gas flow (dry air) and specialized chemical cleaning liquids (i.e. methanol, isopropyl alcohol, deionized water).*

# Delivery requirements

REQ-034997/A

The transportation to the ELI Beamlines facility in Dolní Břežany of the Sputter coating system shall be conducted by the Supplier.

*NOTE: The bid price will be considered by the CA as the final price, including transportation costs*.

# Safety Requirements

REQ-034999/A

The Supplier shall supply a Declaration of Conformity (DoC) for each product type. The DoC shall declare compliance in part with:

* Act No. 176/2008 Coll., as amended (2006/42/EC);
* Act No. 118/2016 Coll., as amended (2014/35/EU);
* Act No. 117/2016 Coll., as amended (2014/30/EU);
* the other relevant EU/EC regulation and ISO standards.

Compliance with these obligations shall be demonstrated by the (EU/EC) DoC and the CE/CCZ marking.

# Quality Requirements

## General Quality Requirements

REQ-035000/A

The Supplier shall provide the Product User Manual as part of the delivered Device. The Manual shall include the instructions and descriptions regarding the following procedures:

* transport, storage and cleaning;
* installation and adjustment;
* safe operation and maintenance procedures.

*NOTE: The manual can be supplied in hardcopy or PDF formats.*

REQ-035001/A

The Supplier shall provide information on outgoing check of the Product. At least this information shall comprise a report about the execution of outgoing check and fulfilment of the technical requirements defined by the product RSD, and completeness of the product.

*NOTE: Alternatively, the Supplier might provide the CA with the information detailed enough to prove meeting all requirements stipulated herein (e.g. catalogue/technical datasheets, product manuals or other similar documentation).*

REQ-035002/A

The Supplier shall establish and maintain a non-conformance control system compatible with ČSN EN ISO 9001 (or equivalent, e.g. EN ISO 9001).

## Acceptance

Acceptance will be carried out by the CA upon delivery and final verification of the Sputter coating system and documentation supporting the verification (see REQ-034999/A and REQ-035000/A). The basis for acceptance will be also the report about the execution of outgoing check and compliance with technical requirements (see REQ-035001/A).

In case of a successful acceptance phase, the CA will provide the Supplier signed acceptance protocol. In case of an unsuccessful acceptance stage, the CA will provide the Supplier Nonconformity Report (NCR) and a process in accordance with   
REQ-035002/A will be applied.

REQ-035003/A

The Acceptance phase shall demonstrate the following:

* Final Product has been successfully verified by the Supplier;
* All detected nonconformities have been solved in accordance with REQ-035002/A;
* Final Product is free of fabrication errors and is ready for the intended operational use.