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| **Deliverable** | **Description** | **Completion** | **Payment** |
| D1 | Detailed schedule of project activities and all corresponding Quality and Verification Plans, and of work procedures | 1 month | 10% |
| D2 | Development of FZU concept design and 3D model and production of detailed engineering drawings for components and subsystems. Verification of structural performance of CIS chambers, resonance frequency analysis of the optical support chassis. | D2A 3 monthsD2B 6 months | 20% |
| D3 | Manufacturing, assembly and factory testing of the CIS1B vacuum chamber and of the optical support chassis | 7 months | 10% |
| D4 | Delivery of CIS1B chamber and of the optical support chassis to ELI-Beamlines | 8 months | 10% |
| D5 | Manufacturing, assembly and factory testing of the CIS1A vacuum chamber and of the optical support chassisManufacturing, assembly and factory testing of CIS1A and CIS1B optomechanical mounts | 9 months | 10% |
| D6 | Delivery of CIS1A chamber and of the optical support chassis to ELI-BeamlinesDelivery of CIS1A and CIS1B optomechanical mounts to ELI-Beamlines | 10 months | 10% |
| D7 | Manufacturing, assembly and factory testing of the CIS2 vacuum chamber and of the internal optical support chassisManufacturing, assembly, and factory testing of the OM4 and OM5 optomechanical mounts | 11 months | 10% |
| D8 | Delivery of CIS2 chamber and of the internal optical support chassis to ELI-BeamlinesDelivery of the OM4 and OM5 optomechanical mounts to ELI-BeamlinesDelivery of the vacuum and optomechanical electronic controllers to ELI-Beamlines | 12 months | 10% |
| D9 | Manufacturing, assembly, factory testing and delivery of the optomechanical mount OM4.5 to ELI-Beamlines  | 13 months | 5% |
| D10 | Acceptance of complete CIS system installed at ELI-Beamlines, with CIS1A, CIS1B and CIS2 chambers mechanically and vacuum interconnected and with all optomechanics installed | 14 months | 5% |

1. **Contractual Deliverables description**
2. **Deliverable D1: Detailed schedule of project activities and all corresponding quality plans and work procedures**

The supplier to whom the Public Contract will be awarded (hereinafter the “***Supplier***”) shall provide a detailed schedule of all project activities; by which is meant a schedule that defines all the activities necessary to individually define, produce or procure and deliver every component within the scope of supply. All activities shall be resourced, allocated start / finish times and linked with relevant dependencies. The amount of detail should be sufficient to identify the longest path of activities through the entire program, thus providing confidence in the overall programme for Deliverables. The scheduled activities shall not be restricted to those of the Supplier but shall include all relevant activities of sub-suppliers, the Client or relevant third parties.

Also within the first month following the Commencement Day, the Supplier shall provide a draft set of Quality and Verification Plans and associated Work Procedures detailing all the work activities and processes required for the design, procurement, fabrication, assembly and test of all products to be supplied under the contract. This shall include aspects such as design review, inspection, analysis and test procedures (Verification Plan), and configuration management, material traceability, cleanliness control, welding procedures and qualifications (Quality Plan). The provided draft set of Quality and Verification Plans shall incorporate as a minimum all required activities listed in Annex 3 (*Quality and Verification Plan*).

Completion: 1 month after Commencement Day

1. **Deliverable D2: Development of FZU concept design and 3D model and production of detailed engineering drawings for components and subsystems. Verification of structural performance of CIS chambers, resonance frequency analysis of the optical support chassis.**

a) The Supplier shall develop detailed engineering drawings based on the preliminary design drawings and 3D model supplied by the Client. These detailed engineering drawings produced by the Supplier will be used in the next steps (D3, D5, D7, and D9) to make production drawings. The purpose of the detailed engineering drawings is to complete the Client’s preliminary design with all necessary mechanical details and to optimize the overall design with respect to the technologies and fabrication methods that will be employed for manufacturing. The accepted detailed engineering drawings and the detailed 3D model developed in this Deliverable will be binding for the Supplier in the manufacturing phase (D3, D5, D7, and D9).

b) A part of this Deliverable D2 will be elaboration of specific details, such as:

• Closing mechanism and hinges of the CIS1A and CIS2 chamber side doors

• Mechanical handling aids for installation of the top lids of the CIS1A and CIS1B chambers

• Configuration of the optical support chassis for all the three chambers and description of the technique selected for avoiding internal thermal and mechanical stress

• Lifting mechanism / lifting points of all the three chambers, of the CIS1A and CIS2 doors and of the CIS1A and CIS1B lids

• Final design of the optical support chassis for each CIS chamber and final design of the isolation bellows legs

• Relief holes in the optical support chassis of all the three chambers and optomechanical mounts to avoid trapped air pockets

• Arrangement of the double O-ring seal of the lid of CIS1B and of the access door of CIS2 chamber

• Internal (vacuum) and external (on the outer surface) cable trays on all the three chambers

• Mechanisms for installation of the CIS2 chamber in the ELI-Beamlines facility, and for assembling and installation of the CIS2 internal support chassis and of the CIS2 optomechanics in the clean L4c laser hall (ISO Class 7 cleanliness) of ELI-Beamlines

• Determination of material thicknesses, configuration of stiffening ribs, flanges, weld locations and details, surface finishes and other similar matters necessary to optimize for fabrication

c) The Supplier shall verify the stiffness and vibrational properties of the developed detailed design of all the three chambers, of their optical support chassis, and of the optomechanical mounts, by means of FEA (Finite Element Analysis) simulations. The acceptable limit of deformations under application of vacuum (stiffness) and vibrational criteria are included in the detailed specification of performance requirements in Annex 2 to this Contract. Analysis of the concept design made by the Client shows that the specified requirements are realistic. The calculations shall also provide evidence of the factor of safety when the CIS chambers are subjected to overpressure up to a value limited by means of a passive safety device (e.g. bursting disk). Results of the analysis shall be provided by Supplier to Client for review. Status of appropriate requirements to be verified by the analysis shall be tracked by the Verification Control Document (VCD), see Annex No. 3, Section 2 (Verification Requirements for Supplier, and shall be the basis for acceptance of D2.

d) A brief technical report shall be provided by the Supplier that lists all the significant changes and enhancements between the FZU concept design and the agreed detail design. For each change there shall be a brief description of the reason for change and justification of the selected solution. This will provide a means of checking that no important features of the concept design have been inadvertently lost or corrupted.

e) The Supplier shall provide an updated detailed 3D model of the CIS1A, CIS1B and CIS2 chambers with their associated components and sub-assemblies (especially of the optical optical support chassis), showing the finally agreed configuration.

f) The Supplier shall provide an updated detailed 3D model of the optomechanical mounts, showing the finally agreed configuration.

g) The Supplier shall provide final Quality and Verification Plan for all the main components and other documentation will be reviewed by the Client, with reference to these Quality and Verification Plan.

The provided documentation shall be reviewed by Client by means of Critical Design Review (CDR) process and its results will be recorded in a CDR Report. The verification of the Design shall be considered complete when the Client and the Supplier mutually agree that, on the basis of the CDR Report and on the basis of the Verification Control Document (VCD) that all corresponding requirements related to the Design were closed out and that all associated verification objectives were fully achieved. The status of the requirements verified in the Review of Design shall be tracked by the Verification Control Document (VCD), see Annex No. 3, Section 2 (Verification Requirements for Supplier) and shall be the basis for acceptance of the Design.

The Supplier shall further submit a timetable of individual major steps in the manufacturing process and factory testing related to D3, D5 D7 and D9. The Client reserves the right to witness verification and testing of the individual components and subsystems at the Supplier’s premises at any of the indicated steps in the manufacturing process, and to monitor implementation of the contract.

It is recognized that the lead-time for the CIS chambers will be longer than for the optomechanical mounts so to even out the effort the Deliverable completion dates are staggered:

Completion: D2A CIS vacuum chambers 3 months after Commencement Day

 D2B Optomechanical mounts 6 months after Commencement Day

1. **Deliverable D3: Manufacturing, assembly and factory testing of the CIS1B vacuum chamber and of the optical support chassis**

Based on the results of Deliverable D2 the Supplier shall provide a full set of final production drawings (including 3D model) for all components of the CIS1B vacuum chamber, of the CIS1B optical support chassis, and of associated components that will be manufactured under this contract.

The Supplier shall manufacture the CIS1B vacuum vessel including the lid and flanges, the optical support chassis, the isolation bellows legs, the vacuum tube connecting chambers CIS1B and CIS2, and associated components, in line with the documentation produced within the D2A Deliverable. Completion of individual major steps of the manufacturing process will be witnessed by the Client according to the Quality Plan developed in Deliverable D2A.

After finishing the individual phases of fabrication and cleaning, the Supplier shall install the CIS1B chamber in ISO Class 7 or better cleanroom at his premises, where all operations and factory testing will be made. Upon assembling the individual components and sub-systems this phase shall verify key parameters of the CIS1B chamber assembly, namely:

* + Vacuum performance and ability to achieve a pressure of 10-6 mbar within no more than 1 hour, 10-7 mbar in time comparable to 4 hours and then maintain this vacuum for a further 24 hours, using a turbomolecular pump with pumping speed 2,300 l/s;
	+ Stability of the CIS1B chamber structure during pump down, quantitative measurements of deformations of the vacuum chamber body;
	+ Validation of the vacuum cleanliness (contaminants-free vacuum) by mass spectroscopy measurements and by another independent verification technique provided by the Client (e.g. sol-gel technique and/or non-volatile residua analysis);
	+ Determination of the leak rate of the assembled chamber with the lid, port covers, and blank flanges;
	+ Mechanical stability of the optical support chassis in different states of the system, especially upon pump down from atmospheric pressure to low pressure (verified for example by sighting a mirror with a high precision auto-collimator);
	+ Functioning of integrated vacuum control system (VCS) with the CIS1B chamber.

The verification of the CIS1B assembly performance shall be made according to the Verification Plan. The results of this performance verification and testing will be a Protocol on Factory Testing of the CIS1B chamber and of the optical support chassis. The verification shall be considered complete when the Client and the Supplier mutually agree that, on the basis of the VCD and of the Protocol on Factory Testing of the CIS1B chamber and of the optical support chassis, all corresponding requirements were closed out and the associated verification objectives were fully achieved. The status of the requirements verified in this phase of Inspection and Testing shall be tracked by the Verification Control Document (VCD), see Annex No. 3, Section 2 (Verification Requirements for Supplier) and shall be the basis for acceptance of D3.

Completion: 7 months and after Commencement Day

1. **Deliverable D4: Delivery of CIS1B chamber and of the optical support chassis to ELI-Beamlines**

The Supplier shall prepare for transport of the CS1B vacuum chamber, the optical support chassis, all elements interconnecting the chamber and the chassis including the isolation legs, vacuum gauges, valves and all auxiliary vacuum components, and the vacuum tube connecting the chambers CIS1B and CIS2. The CIS1B chamber and components of the optical support chassis shall be packed separately.

For the duration of its transport the vacuum chamber shall be hermetically sealed under dry air or nitrogen. The initial wrapping of all parts shall be in multiple layers of plastic film (as sheet or bags) of type specifically for use in contamination controlled areas. This clean conditions wrapping will be further enclosed in robust outer packaging and transport crates as necessary for protection and handling during shipping to the ELI-Beamlines site.

The Supplier will transport the components to the ELI-Beamlines facility and will remain responsible for them (with appropriate insurance cover) until acceptance of D4. Offloading of the CIS1B chamber at the ELI-Beamlines building entrance will be made by fork lift truck.

On the ELI-Beamlines site, the CIS1B chamber, the optical support chassis and other delivered components will be unpacked by Supplier in ISO Class 7 cleanroom and will be inspected for absence of any damage due to transport, according to the Verification Control Document (VCD). This inspection shall be the basis for acceptance of D4.

Completion: 8 months after Commencement Day

1. **Deliverable D5: Manufacturing, assembly and factory testing of the CIS1A vacuum chamber and of the optical support chassis. Manufacturing, assembly and factory testing of CIS1A and CIS1B optomechanical mounts.**

Based on the results of Deliverable D2A the Supplier shall provide a full set of final production drawings (including 3D model) for all components of the CIS1A vacuum chamber, of CIS1A optical support chassis and associated components that will be manufactured under this contract.

The Supplier shall manufacture the CIS1A vacuum chamber including the side doors, the upper lid and flanges, the optical support chassis, the isolation bellows legs, and the interconnecting vacuum square tube between CIS1A and CIS1B chambers, in line with the documentation produced within the D2A Deliverable. Completion of individual major steps of the manufacturing process will be witnessed by the Client according to the Quality Plan developed in Deliverable D2.

After finishing the individual phases of fabrication and cleaning, the Supplier shall install the CIS1A chamber in ISO Class 7 or better cleanroom at his premises, where all operations and factory testing will be made. Upon assembling the individual components and sub-systems this phase shall verify key parameters of the CIS1A chamber assembly, namely:

* + Vacuum performance and ability to achieve a pressure of 10-6 mbar within no more than 1 hour, 10-7 mbar in time comparable to 4 hours and then maintain this vacuum for a further 24 hours, using a turbomolecular pump with pumping speed 2,300 l/s;
	+ Stability of the CIS1A chamber structure during pump down, quantitative measurements of deformations of the vacuum chamber body;
	+ Validation of the vacuum cleanliness (contaminants-free vacuum) by mass spectroscopy measurements and by another independent verification technique provided by the Client (e.g. sol-gel technique and/or non-volatile residua analysis);
	+ Determination of the leak rate of the assembled chamber with doors, port covers, blank flanges and isolation valves fitted;
	+ Mechanical stability of the optical support chassis in different states of the system, especially upon pump down from atmospheric pressure to low pressure (verified for example by sighting a mirror with a high precision auto-collimator).

The verification of the CIS1A assembly shall be made according to the Verification Plan. The results of this performance verification and testing will be a Protocol on Factory Testing of the CIS1A chamber and of the CIS1A optical support chassis. The verification shall be considered complete when the Client and the Supplier mutually agree that, on the basis of the VCD and of the Protocol on Factory Testing of the CIS1A chamber and of the optical support chassis, all corresponding requirements were closed out and the associated verification objectives were fully achieved.

As part of this Deliverable the Supplier shall also develop detailed engineering drawings of the individual optomechanics in CIS1A and CIS1B (except OM4) in line with the documentation produced within the D2B Deliverable.

The Supplier shall manufacture the mounts OM1, OM2, OMBD, OM3, OAP1, OM3.5, and OM3SA. The supplier shall also manufacture the laser shutter. The Supplier shall install the integrated optomechanical components in an ISO Class 5 or better cleanroom at his premises, where all assembly operations and testing shall be made. The Supplier shall integrate the mechanical components of the mounts with the respective manual and electrical actuators and other sensors. Upon integration with vacuum-compatible cabling and connectors, all electrically actuated optomechanical mounts shall be connected to corresponding electronic drivers.

The Supplier shall provide all equipment for the required testing of the optomechanical mounts.

The Supplier shall validate key performance parameters of the mounts at their works, namely:

* + Demonstration of precision on individual movements of the mounts, achievement of required minimal step, demonstration of stability of each mount
	+ Vacuum testing showing ability to achieve pressure 10-7 mbar
	+ Validation of the vacuum cleanliness (contaminants-free vacuum) by mass spectroscopy measurements
	+ Determination of the outgassing rate of each mount
	+ Functioning of the motion control system with all electrical actuators.

The verification of the optomechanical mounts performance shall be made according to the Verification Plan. The results of this performance verification and testing will be a Protocol on Factory Testing of the CIS1A and CIS1B optomechanical mounts.

The statuses of the requirements verified in this phase for the CIS1A chamber assembly and for the CIS1A and CIS1B optomechanical mounts shall be tracked by the Verification Control Document (VCD), see Annex No. 3, Section 2 (Verification Requirements for Supplier) and shall be the basis for acceptance of D5.

Completion: 9 months and after Commencement Day

1. **Deliverable D6: Delivery of CIS1A chamber and of the optical support chassis to ELI-Beamlines. Delivery of CIS1A and CIS1B optomechanical mounts to ELI-Beamlines**

The Supplier shall prepare for transport of the CS1A vacuum chamber, the optical support chassis, all elements interconnecting the chamber and the chassis including the isolation legs, all auxiliary CIS1A vacuum components, and the interconnecting vacuum tube between CIS1A and CIS1B chambers,. The CIS1A chamber and components of the optical support chassis shall be packed separately.

For the duration of its transport the vacuum chamber shall be hermetically sealed under dry air or nitrogen. The initial wrapping of all parts shall be in multiple layers of plastic film (as sheet or bags) of type specifically for use in contamination controlled areas. This clean conditions wrapping will be further enclosed in robust outer packaging and transport crates as necessary for protection and handling during shipping to the ELI-Beamlines site.

The Supplier will transport the components to the ELI-Beamlines facility and will remain responsible for them (with appropriate insurance cover) until acceptance of D6. Offloading of the CIS1A chamber at the ELI-Beamlines building entrance will be made by fork lift truck.

On the ELI-Beamlines site, the CIS1A chamber, the optical support chassis and other delivered components will be unpacked by Supplier in ISO Class 7 cleanroom and will be inspected for absence of any damage due to transport, according to the Verification Control Document (VCD). This inspection shall be the basis for acceptance of D6.

The Supplier shall also pack the CIS1A and CIS1B optomechanical mounts (OM1, OM2, OMBD, OM3, OAP1, OM3.5, and OM3SA) and all related equipment (wiring, connectors, drivers, etc.). All mounts and components that will be installed in vacuum shall be hermetically sealed under dry air or nitrogen.

The Supplier shall transport the optomechanical mounts to the ELI-Beamlines facility.

On the ELI-Beamlines site, the mounts will be unpacked by Supplier in ISO Class 5 cleanroom, and will be tested according to the Protocol on Reception Testing of the optomechanical mounts.

All required tests associated with on-site verification of the delivered optomechanics shall be identified in the Verification Plan. The results of this deliverable will be an Handover Protocol of the optomechanical mounts to the ELI-Beamlines facility.

The status of requirements verified in this phase shall be tracked by the Verification Control Document (VCD), see Annex No. 3, Section 2 (Verification Requirements for Supplier) and shall be the basis for acceptance of D6.

Completion: 10 months after Commencement Day

1. **Deliverable D7: Manufacturing, assembly and factory testing of the CIS2 vacuum chamber and of the internal optical support chassis. Manufacturing, assembly, and factory testing of the OM4 and OM5 optomechanical mounts.**

Based on the results of Deliverable D2A the Supplier shall provide a full set of final production drawings (including 3D model) for all components of the CIS2 vacuum chamber, of CIS2 optical support chassis and associated components that will be manufactured under this contract.

The Supplier shall manufacture the CIS2 vacuum vessel including the side door and flanges, the optical support chassis, the isolation bellows legs, in line with the documentation produced within the D2A Deliverable. Completion of individual major steps of the manufacturing process will be witnessed by the Client according to the Quality Plan developed in Deliverable D2A.

After finishing the individual phases of fabrication and cleaning, the Supplier shall install the CIS2 chamber in ISO Class 7 or better cleanroom at his premises, where all operations and factory testing will be made. Upon assembling the individual components and sub-systems this phase shall verify key parameters of the CIS2 chamber assembly, namely:

* + Vacuum performance and ability to achieve a pressure of 10-6 mbar within no more than 2 hours, 10-7 mbar in time comparable to 6 hours and then maintain this vacuum for a further 24 hours, using a turbomolecular pump with pumping speed 2,300 l/s;
	+ Stability of the CIS2 chamber structure during pump down, quantitative measurements of deformations of the vacuum chamber body;
	+ Validation of the vacuum cleanliness (contaminants-free vacuum) by mass spectroscopy measurements and by another independent verification technique provided by the Client (e.g. sol-gel technique and/or non-volatile residua analysis);
	+ Determination of the leak rate of the assembled chamber with door, port covers, and blank flanges;
	+ Mechanical stability of the CIS2 optical support chassis in different states of the system, especially upon pump down from atmospheric pressure to low pressure (verified for example by sighting a mirror with a high precision auto-collimator).

The verification of the CIS2 assembly shall be made according to the Verification Plan. The results of this performance verification and testing will be a Protocol on Factory Testing of the CIS2 chamber and of the optical support chassis. The verification shall be considered complete when the Client and the Supplier mutually agree that, on the basis of the VCD and of the Protocol on Factory Testing of the CIS2 chamber and of the optical support chassis, all corresponding requirements were closed out and the associated verification objectives were fully achieved.

As part of this Deliverable the Supplier shall also develop detailed engineering drawings of the optomechanics OM4 and OM5 in line with the documentation produced within the D2B Deliverable.

The Supplier shall manufacture the mounts OM4 and OM5. The Supplier shall install the integrated optomechanical mounts in an ISO Class 5 or better cleanroom at his premises, where all assembly operations and testing shall be made. The Supplier shall integrate the mechanical components of the mounts with the respective manual and electrical actuators and other sensors. Upon integration with vacuum-compatible cabling and connectors, all electrically actuated optomechanical mounts shall be connected to corresponding electronic drivers.

The Supplier shall provide all equipment for the required testing of these optomechanical mounts.

The Supplier shall validate key performance parameters of the mounts at their works, namely:

* + Demonstration of precision on individual movements of the mounts, achievement of required minimal step, demonstration of stability of each mount
	+ Vacuum testing showing ability to achieve pressure 10-7 mbar
	+ Validation of the vacuum cleanliness (contaminants-free vacuum) by mass spectroscopy measurements
	+ Determination of the outgassing rate of each mount
	+ Functioning of the motion control system with all OM4 and OM5 electrical actuators.

The verification of the optomechanical mounts performance shall be made according to the Verification Plan. The results of this performance verification and testing will be a Protocol on Factory Testing of the optomechanical mounts OM4 and OM5.

The statuses of the requirements verified in this phase for the CIS2 chamber assembly and for the OM4 and OM5 optomechanical mounts shall be tracked by the Verification Control Document (VCD), see Annex No. 3, Section 2 (Verification Requirements for Supplier) and shall be the basis for acceptance of D7.

Completion: 11 months and after Commencement Day

1. **Deliverable D8: Delivery of CIS2 chamber and of the internal optical support chassis to ELI-Beamlines. Delivery of the OM4 and OM5 optomechanical mounts to ELI-Beamlines. Delivery of the vacuum and optomechanical electronic controllers to ELI-Beamlines.**

The Supplier shall prepare for transport of the CIS2 vacuum chamber, the optical support chassis, all elements interconnecting the chamber and the chassis including the isolation legs, and all auxiliary CIS2 vacuum components. The CIS2 chamber and components of the optical support chassis shall be packed separately.

For the duration of its transport the CIS2 vacuum chamber shall be hermetically sealed under dry air or nitrogen. The initial wrapping of all parts shall be in multiple layers of plastic film (as sheet or bags) of type specifically for use in contamination controlled areas. This clean conditions wrapping will be further enclosed in robust outer packaging and transport crates as necessary for protection and handling during shipping to the ELI-Beamlines site.

The Supplier will transport the components to the ELI-Beamlines facility and will remain responsible for them (with appropriate insurance cover) until acceptance of D8. Offloading of the CIS2 chamber at the ELI-Beamlines building entrance will be made by fork lift truck.

On the ELI-Beamlines site, the CIS2 chamber, the optical support chassis and other delivered components will be unpacked by Supplier in ISO Class 7 cleanroom and will be inspected for absence of any damage due to transport, according to the Verification Control Document (VCD). This inspection shall be the basis for acceptance of D8.

The Supplier shall also pack the OM4 and OM5 optomechanical mounts and all related equipment (wiring, connectors, drivers, etc.). All mounts and components that will be installed in vacuum shall be hermetically sealed under dry air or nitrogen.

The Supplier shall transport the optomechanical mounts to the ELI-Beamlines facility.

On the ELI-Beamlines site, the mounts will be unpacked by Supplier in ISO Class 5 cleanroom, and will be tested according to the Protocol on Reception Testing of the optomechanical mounts.

All required tests associated with on-site verification of the delivered optomechanics shall be identified in the Verification Plan. The results of this deliverable will be an Handover Protocol of the optomechanical mounts to the ELI-Beamlines facility.

The status of requirements verified in this phase shall be tracked by the Verification Control Document (VCD), see Annex No. 3, Section 2 (Verification Requirements for Supplier) and shall be the basis for acceptance of D8.

Completion: 12 months after Commencement Day

1. **Deliverable D9: Manufacturing, assembly, factory testing and delivery of the optomechanical mount OM4.5 to ELI-Beamlines**

As part of this Deliverable the Supplier shall develop detailed engineering drawings of the optomechanics OM4.5 in line with the documentation produced within the D2B Deliverable.

The Supplier shall manufacture the OM4.5 mount. The Supplier shall install the integrated optomechanical mount in an ISO Class 5 or better cleanroom at his premises, where all assembly operations and testing shall be made. The Supplier shall integrate the mechanical components of the mount with the respective manual and electrical actuators and other sensors. The mount will be integrated with vacuum-compatible cabling and connectors, and shall be connected to an electronic driver for demonstrating functionality of the electrical actuators.

The Supplier shall provide all equipment for the required testing of this OM4.5 optomechanical mount.

The Supplier shall validate key performance parameters of the mount at their works, namely:

* + Demonstration of precision on individual movements of the mount, achievement of required minimal step, demonstration of stability of the mount
	+ Vacuum testing showing ability to achieve pressure 10-7 mbar
	+ Validation of the vacuum cleanliness (contaminants-free vacuum) by mass spectroscopy measurements
	+ Determination of the outgassing rate of the mount.

The verification of this optomechanical mount performance shall be made according to the Verification Plan. The results of this performance verification and testing will be a Protocol on Factory Testing of the optomechanical mount OM4.5.

Upon completion of the factory testing the Supplier shall pack the OM4.5 optomechanical mount and all related equipment (wiring, connectors, etc.). The mount and components that will be installed in vacuum shall be hermetically sealed under dry air or nitrogen.

The Supplier shall transport the optomechanical mounts to the ELI-Beamlines facility.

On the ELI-Beamlines site, the mount will be unpacked by Supplier in ISO Class 5 cleanroom, and will be tested according to the Protocol on Reception Testing of the optomechanical mounts.

All required tests associated with on-site verification of the delivered OM4.5 mount shall be identified in the Verification Plan. The results of this deliverable will be an Handover Protocol of the OM4.5 optomechanical mount to the ELI-Beamlines facility.

The status of requirements verified in this phase shall be tracked by the Verification Control Document (VCD), see Annex No. 3, Section 2 (Verification Requirements for Supplier) and shall be the basis for acceptance of D9.

Completion: 13 months after Commencement Day

1. **Deliverable D10: Acceptance of complete CIS system installed at ELI-Beamlines, with CIS1A, CIS1B and CIS2 chambers mechanically and vacuum interconnected and with all optomechanics installed**

After all the three CIS vacuum chambers will be installed, interconnected, connected to the ELI-Beamlines services (central vacuum, compressed air, cooling water) and connected to the vacuum electronic controller, and after all optomechanical mounts will be installed and connected to the optomechanical electronic controllers, the Client will verify functionality of the complete CIS. The status of requirements verified in this phase shall be tracked by the Verification Control Document (VCD), see Annex No. 3, Section 2 (Verification Requirements for Supplier), and will be basis of the Acceptance Protocol of complete CIS system and acceptance of D10.

Completion: 14 months after Commencement Day

1. **Contractual options**

**Contractual option 1 (Optional installation technical support)**

The following services are agreed as contractual option herewith. The Client is entitled to require provision of Supplier’s technical support during installation of the CIS chambers and/or the CIS optomechanics. The Client is entitled (but has no duty to do so) to ask the Supplier for the support at its full discretion at any time starting by D4 and up to 2 months after D9. The maximum extent of this contractual option is 20 man days. Detailed conditions of provision of the support (extent, time of provision, profession of specialists etc.) shall be agreed between Contractual parties. However, the Supplier will commence provision of the support no later than 10 working days after written request by the Client. The price of optional support (as man-day price) is stipulated separately by the Bid and shall be paid if any optional support is provided after its due provision.

**Contractual option 2 (Optional design works)**

The following services are agreed as contractual option herewith. The Client is entitled to require provision of optional design works. The Client is entitled (but has no duty to do so) to ask the Supplier for the services at its full discretion before or at the time of acceptance of the D8 Deliverable. The maximum extent of this contractual option is 40 man days. Detailed conditions of provision of the services (extent, subject matter of design works etc.) shall be agreed between Contractual parties. However, the Supplier will commence provision of the support no later than 10 working days after written request by the Client. The price of optional services (as man-day price) is stipulated separately by the Bid and shall be paid if any optional services are provided after their due provision.