**ORDER DESCRIPTION**

1. **Subject of the order**

Object of this tender is the delivery and startup of optical system for in-situ

and post-growth of measurement of Mercury Cadmium Telluride growth ratio in MOCVD epitaxial layers at the Purchaser’s location according to the specifications detailed under point 5, as well as personnel training, according to the list of requirements under point 2.

The Contractor shall provide warranty and service for the system:

1. the warranty period shall be at least 24 months from the signature of the acceptance protocol.
2. the Contractor shall provide machine service free of charge during the warranty period:

-the time to start the repair will take place within a maximum of 3 working days from the moment of reporting the defect,

1. the Contractor shall provide paid a lifetime post-warranty service and access to spare parts
2. the Contractor shall provide lifetime support by telephone and e-mail with a response time of less than 8 hours, in business days;
3. the Contractor shall provide paid machine service reaction time (the time until the beginning of repair actions) in case of malfunction shall be less than 3 business days from the moment the malfunction is reported,
4. The Contractor will provide lifetime technical support including free updates and the possibility of expanding the device.

Additionally The Contractor will ensure compliance of the goods with the CE declaration - a document issued by the product manufacturer or his authorized representative, constituting a legally binding promise stating the product's compliance with the essential requirements of the relevant European Union directives.

1. **The scope of the subject of the contract**
2. Delivery, installation and startup of optical system for in-situ measurement of Mercury Cadmium Telluride MOCVD growth ratio consisting of:
   1. System with two laser sources for optical in-situ measurement:
      1. Thick CdTe growth
      2. Hg1-xCdxTe growth ratio based on reflectance changes during IMP growth
   2. Software for operating the device and for analyzing results of measurements
   3. Installation and calibration of measurement tools
   4. Personal start-up training for system users at Vigo System S.A.
3. Visit of the Contractor's representative during the warranty period for routine calibration of in-situ optical measurement of the growth rate of cadmium-mercury telluride in the MOCVD technology to the requirements of the contracting authority, with the participation of operators.
4. **Evaluation criteria**

Offers will be graded with point scale with maximum grade of 100.

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| --- | --- | --- |
| Criterium | Maximum points (S) | Method of awarding points |
| Net Price (P) | 100 | S x Pmin/Pi |

Where:

● Pi is the net price of the delivery of the ordered device, including the delivery, assembly and commissioning training of employees in operation - for a given submitted offer

● Pmin is the minimum net price for the delivery of the ordered device, including the delivery, assembly and commissioning training of the employees on the operation of all submitted offers

The final score will be rounded to two decimal places (rounding up from "5").

1. **Delivery time**

The delivery will be carried out within 16 weeks of signing the contract.

**5. Technical specifications**

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| --- | --- |
| **Device name:** **Optical system for in-situ measurement of Mercury Cadmium Telluride MOCVD growth ratio** | |
| Subassembly | Parametrs/Functions | |
| Optical measurement of CdTe growth | * Optical system equipped with laser source emitting radiation weakly absorbed by CdTe, enabling layer thickness measurement during the growth based on interferogram analysis of beams reflected form epitaxial growth surface and substrate (GaAs) surface * Software for live calculation of thickness and growth ratio of CdTe in given by user period of time * Precision of CdTe thickness measurement below 1% for 1.5um thick layer | |
| Optical measurement of Hg1-xCdxTe growth | * Optical system for wafer reflectance measurement during epitaxial growth * Software for calculation of cadmium mole fraction in Hg1-xCdxTe layer during IMP growth, based on reflectance changes in time * Precision of in- situ measurement of mole fraction of cadmium in Hg(1-x)Cd(x)Te better than ± 0,005 for IMP growth | |
| Software for measurement results analysis | Software optimization according to purchasers requirements including   * Possibility of comparing results from various epitaxial runs (including in- situ and post growth) * Possibility of data export to .txt files and for spreadsheets * Possibility of notification output using network connection for user defined parameters * Ensuring data connection between the optical system and computer used for MOCVD control | |
| Others | * Epitaxial layer roughness measurement * Wafer rotation speed estimation | |
| Computer | * Computer with required for software | |
| Warranty and service | * the Contractor shall provide machine service free of charge during the warranty period: * -the time to start the repair will take place within a maximum of 3 working days from the moment of reporting the defect, * the Contractor shall provide paid a lifetime post-warranty service and access to spare parts * the Contractor shall provide lifetime support by telephone and e-mail with a response time of less than 8 hours, in business days; * the Contractor shall provide paid machine service reaction time (the time until the beginning of repair actions) in case of malfunction shall be less than 3 business days from the moment the malfunction is reported, * The Contractor will provide lifetime technical support including free updates and the possibility of expanding the device. | |
| Other important provisions | * As part of the installation of the device, the Contractor, with the participation of the Ordering Party, will carry out an inspection and carry out the necessary measurements and tests to best adapt the device to the Ordering Party's needs and confirm the parameters described in the technical specification (Precision of CdTe thickness measurement; Precision of in- situ measurement of mole fraction of cadmium in Hg(1-x)Cd(x)Te)   ● The contractor will install the device at the Vigo System premises and will immediately calibrate the components with the participation of designated Vigo System employees  ● The Contractor will ensure the compliance of the goods with the CE declaration.  ● The device is to be new, not presented at fairs, shows and other forms of demonstration  ● The contractor must provide a user manual in Polish or English | |

**6. Additional information**

All delivered parts must be new, unused. Parts must be packaged in a way that ensures safe transport. Elements will be checked for compliance with the specifications given above. In case of lack of compliance elements will be returned to the Contractor. All matters regarding the Contractor’s liability for non-compliance of the delivered goods with the technical specification included in the detailed description of the above order, are regulated by the delivery agreement, which will be concluded between the Contractor and the Contracting party.