**Technical Specifications**

**Subject of VZ:** SW for planning the movement of the robotic arm for printing

**Manufacturer:** *to be specified by a bidder*

**Exact type designation:** *to be specified by a bidder*

**Basic Description of the Subject of the Delivery:**

The required software must provide a comprehensive solution for planning and controlling the movement of robots during 3D printing, in particular using silicate materials. It should support at least two major robot platforms such as ABB or UR, thus providing compatibility with various industrial robots. The software must incorporate advanced motion trajectory optimization algorithms that take into account both robot constraints and print material properties to ensure efficient and stable printing. It is necessary to support realistic motion simulation to verify the motion trajectory before an actual execution avoiding any errors or collisions. The software will include algorithms for motion planning when printing using silicate materials to ensure accurate motion and to minimaze material wasting. The user will have an intuitive interface to configure motion planning, check simulations and analyse results. The software must support import of 3D models from common CAD formats (e.g. STL, STEP, IGES) for automatic preparation of the printing process. Generating G-codes for 3D printing must be automatic with the ability to adjust printing parameters such as speed and layer height. The system shall be flexible enough to support various printing technologies and materials, with the ability to define specific parameters for various processes.

**Basic (minimum) technical parameters**

The Bidder shall indicate the fulfilment of all basic technical parameters set out by the Contracting Authority in this document in the form of a description of the technical solution in the bid, or indicate values of individual technical parameters of the offered equipment in the table Basic technical specifications of the offered equipment.

  **Minimum technical parameters of the VZ:**

|  |  |  |
| --- | --- | --- |
| Parameter   | Requirement by the Contracting Authority  | Value of the bidder  |
| **SW for motion planning of robotic system during printing silicate materials** |
| Number of concurrently valid licenses till 6.2026 | Min 1 |  |
| Number of concurrently valid licenses from 7.2026 till 6.2028 | Min 2 |  |
| Multi-manufacturer support (e.g. ABB, KUKA, FANUC and Yaskawa). Direct connection to the robot's motion control system.  | Min 2 |  |
| Optimizing the motion trajectory with respect to any robot and printing constraints. Real-time movements support. | Yes |  |
| Simulation of manipulator movements within the 3D space with the possibility of trajectory verification before the actual execution. | Yes |  |
| Automatic generating G-codes for 3D printing with the possibility to adjust the parameters of the printing process (speed, layer, etc.). | Yes |  |
| Can be customized for various types of manipulators, including SCARA configurations, cartesian robots and six-axis robots. | Yes |  |
| Features to detect and prevent collisions between robot, tool and working environment. Ensuring safe operation. | Yes |  |
| Intuitive and easy-to-use GUI for scheduling configuration, simulation control and results analysis. | Yes |  |
| The ability to analyze and debug trajectories, including motion history display and optimization to minimize time delays. | Yes |  |
| Support for importing 3D models using CAD systems (e.g. STEP, STL, IGES) for automatic preparation of the printing process. | Yes |  |
| Choice of algorithm for motion planning in 3D printing of silicate materials. Adjustment of movements to ensure stable and efficient production. | Advantages |  |
| Ability to control multiple robots of various brands simultaneously for complex tasks, including synchronization and avoiding collisions between robots.  | Advantages |  |
| The ability to adapt real-time motion planning based on task or conditions changing, such as changes in object geometry. | Advantages |  |
| Algorithms for optimizing material consumption during printing and selecting optimal trajectories to minimize waste. | Advantages |  |
| Support for various printing technologies and materials with the ability to define specific parameters for various processes. | Advantages |  |

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*Name and position of the person authorised to act for and on behalf of the Contractor. .............................................................*

*Signature. .............................................................*