Obsah obrázku text

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**ALFAGEN – CNC grindER**

Annex 3 of Tender Documentation – Technical Specification

AL INVEST Břidličná, a.s.

Bruntálská 167

793 51 Břidličná

An open above-threshold public contract for the supply in compliance with S. 56 of Act No. 134/2016 Coll., „Public Procurement Act“, as amended, (hereinafter also as the "**Act**" or "**ZZVZ**"

Procurement procedure

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1. General Information

Under these Technical Conditions, the Contracting Authority specifies the characteristics of the requested subject of fulfilment, i.e. the **minimum** technical requirements that the contractor’s subject of fulfilment needs to meet. If a contractor offers a subject of fulfilment that does not meet any of the technical conditions, it shall be excluded from the tender on account of not meeting the tender conditions.

* 1. Introduction

The company, ALINVEST Břidličná, a.s. (“ALINVEST”), with its 800 local employees is a leading European producer of packaging materials and rolled semi-finished aluminium products. Its origins date back to the year 1852, when the construction of the flax processing company was launched. ALINVEST is a member of the European Aluminium Foil Association (EAFA), Packaging Institute SYBA, Southern Bohemian Chamber of Commerce and Czech Testing Laboratories Association.

ALINVEST’s state-of-the-art research and development unit and certificates, ISO 9001:2008, ISO/TS 16 949:209, BRC/IOP, AD 2000 WO, and EN 15088, guarantee the quality and reliability of its products. The company also holds various packaging and automotive certificates, which are relevant for the present project.

ALINVEST belongs to the MTX Group a.s. – an industrial-business holding company based in Prague which mainly focuses on management, financing and coordination of manufacturing and trading member companies. In the Central European area, the company has its agencies in the Czech Republic, Germany, Austria and Poland. It primarily trades in metallurgical semi-finished products, production and the sale of fuel coke, aluminium and copper products.

MTX Group a.s. is a joint-stock company incorporated in the register of companies kept by the Municipal Court in Prague, Czech Republic, Section B, File 10649, as of the 31st March 2006. The company has its registered office at Štěpánská 621/34, 110 00 Prague 1.

MTX Group a.s. was founded by Petr Otava Sr. In 2015, he was succeeded by his son, Petr Otava Jr. The MTX Group has expanded remarkably abroad with manufacturing activities that affect a number of industrial branches such as parts for the automotive industry as well as metallurgy and food processing.

* 1. Place of business, Project site

The project will take place at ALINVEST’s registered office at Bruntálská 167, 793 51 Břidličná, Czech Republic. The entire affected area is the property of ALINVEST Břidličná a.s., making it the designated site for the installation and operation of the new grinding machine.

The Annex\_10\_Master\_layout provides a detailed overview of the site, including communication pathways, access routes, and the specific locations A and B within the current grinding plant where the new grinder will be installed. The entry gate dimensions and possible placement areas for the machine are also specified in this documents, with designated installation zones marked by hatched rectangles. The Master\_layout\_A and Master\_layout\_B from Annex\_10\_Master\_layout feature different installation positions for the grinder, and we will require design proposals for **both locations**, allowing us to choose the most advantageous option for our needs. The axis of the clamped workpiece cannot be higher than 1200 mm from the floor.

Additionally, Annex 15\_Photos includes photographic documentation corresponding to the areas outlined in the Annex\_10\_Master\_layout\_A and Annex\_10\_Master\_layout\_B, ensuring an accurate representation of the site’s conditions and access points.

For the installation process, ALINVEST’s grinding plant is equipped with a 20-ton overhead crane, which will be available to assist in unloading and positioning the machine.

* 1. Company’s approach to the environment

ALINVEST is committed to assume a part of responsibility for the conservation and protection of the environment within the region. In 2018, a voluntary agreement was signed with the Moravian-Silesian Regional Authority which governs the obligations of individual parties. The obligations deal with the reduction of dust nuisance, compilation of a power management study and a comprehensive power management conception, which would reduce the power demand of production and service operations. The agreement also covers the replacement of diesel forklift trucks with electric ones.

To guarantee the continuous quality of the final products and to achieve a sustainable production growth, the most important strategic investments include not only the technology upgrades but also those of an environmental nature, which address environmental protection and air pollution control. These upgrades will put the company in compliance with the environmental management requirements as per ISO 14000, which will qualify it to acquire this certificate.

Considerable financial resources are expended every year for comprehensive solutions to improve the environment.

ALINVEST Břidličná a.s. is also a member of the EKO-KOM collective compliance system.

The company is a holder of the Integrated Pollution Prevention and Control (IPPC) permit, for which the compliance parameters are always verified on an annual basis.

Machinery used in the manufacturing plant is registered in the EU ETS system. Emission assessment is compiled annually.

* 1. Project purpose and objective

ALINVEST is considering buying new grinder. The main task for the new grinder is to grind rolls for strip casting (TRC rolls), but the new grinder should be capable to grind also rolls for cold milling. The list of all rolls is part of this specification. Future location of new grinder is in current grind house of ALINVEST, details of future location is mentioned bellow.

* 1. Other general requirements
     1. Standards

All equipment supplied, and related work (layout, installation, and operation) shall comply with all CE and EU-local applicable laws and regulations, including, but not limited to, those relating to environment, health and safety of workers.

The CONTRACTOR shall be ISO 9001 certified.

All equipment designed for fabrication in the European Union (EU) shall be designed to use commonly available metric standard commodities, e.g. mm thickness steel sheet, plate etc.

Design must comply with standards. Documentation of compliance must be provided to the Client. Any OEM components supplied, which are not a part of the overall assembly, must be CE marked. The following list of directives shall be reviewed for applicability to the equipment being produced. If the event that the Contractor´s standards are not present the following EU directives need to be applied for their products.

* Regulation (EU) 2023/988 - General product safety
* Directive 2014/30/EU - Electromagnetic compatibility
* Directive 2006/42/EC – Machinery
* Directive 2014/35/EU - Electrical equipment designed for use within certain voltage limits
* Directive 2014/29/EU - Simple pressure vessels
* Directive 2009/125/EC - Ecodesign requirements for energy-related products
* Regulation (EC) 1005/2009 - Ozone depleting substances
* Regulation (EU) 2024/573 - Fluorinated Greenhouse Gases
* Directive 2014/68/EU - Pressure equipment
* Council Directive EU 92/58/EEC - Safety and/or health signs at work

The use of parts which are discontinued by manufactures is not allowed. Exceptions must be approved by ALINVEST.

* + 1. Accessibility and replaceability

All working parts must be designed so as to ensure the easiness of maintenance, control, inspection, monitoring, lubrication and replacement during minimum down times, with the highest possible safety and ergonomics.

* + 1. Safety

All the equipment and machines must be designed with and incorporate safety devices wherever there is potential risk for the operators, and with adequate measures for safe access to the staff and the vicinity of the machines for operation and maintenance. These items must not only include the conventional elements of the machinery but also additional covers, guards, barriers, steps, ladders, railings, coupling guards, belt covers, transmission and chain covers, etc. that are necessary for safe and ergonomic operation of the equipment. All the details of the structures that are necessary for correct operation and maintenance must be specified by the Contractor. The Contractor shall specify the safety needs which may produce compulsory blocking between functions and consequences for the operation.

* 1. Scope of the Works – Major projected parts

The entire supply shall consist of the delivery of equipment (grinder) that matches all technical criteria mentioned in this document. The scope of supply also includes the delivery of the equipment to the site, as well as the supervision of its installation, commissioning, and testing.

* 1. Technical offer contents

The following documents shall be provided with the transmittal of the offer:

* Detailed technical description of the grinder (including description of individual sub-devices / equipment),
* Estimated layouts indicating the overall arrangement (top and side views) and configuration, including sub-devices and a freestanding, pillar-mounted slewing jib crane for changing grinding wheels, with a minimum loading capacity 500 kg.
* Logistical study – transport and placement of parts over 20 tons to the designated locations
* Proposal of placing the grinder into the marked area in the Master\_layout\_A and Master\_layout\_B, including the location of the slewing jib crane for handling the grinding wheels (ALINVEST request proposal for both variants).
* Estimated consumption at take over point (TOP) of cooling water, process media (compressed air,... as required for the scope) and their quality requirements (data shall be understood as basic information – but fitting 90 % to final values confirmed during basic engineering) - minimum content, if it is aplicatible:
  + Temperature (°C): Supply line and delta (between supply - / return line)
  + Pressure (MPa): Supply line and delta (between supply - / return line)
  + Flow rate (m3/h): Constant and peak
  + Quality
  + All other key requirements as per corresponding media
* Electrical consumers with installed power [kW] versus real active power [kW] during production as to be transmitted with the technical offer.
* Flow diagrams for each media with TOPs
* Other important information (accessories or production method) not specified above which the Contractor considers to be worth mentioning to the Client in the technical offer to ensure safe and reliable functioning of the grinder.
* Filled prefered equipment vendor list.
* Capital spares (part of commerical offer)
* Wear parts, consumables required for the first 6 months of production

1. Scope of supply

The subject of the tender is a request for high precision heavy duty roll grinder. The grinder should be stand alone machine (foundation free). The main purpose of the grinder is to grind TRC (twin roll casting) rolls from new cast house.

The grinder must be capable of precisely grinding all rolls specified in Table 1 of this document, as detailed in Annex\_6\_Drawings\_of\_rolls.

Table 1



Note for roll 60-10-33x-xxx and KO – 292/B: external shell diameter is thermally fitted to the roll body, forming a unified structure that co-rotates with the roll itself

The selected Contractor will be responsible for integrated supply, supervision of installation and commissioning, including:

* Machine supply, ensuring full compliance with technical specifications.
* Water coolant filtration system equipped with magnetic separator, paper filter and guard filter, installaled in a pit under floor level.
* Start-up material with exclusion of coolant water.
* Safety fencing including all safety elements in compliance with EU legislation.
* Complete sets of materials required for acceptance tests, including grinding wheels, at least three grinding wheel flanges.
* Complete sets of materials required for acceptance tests, including grinding wheels, at least three grinding wheel flanges.
* interchangeable steady rests and false jaws/bearing shoes for all rolls listed in Table 1, except for future possible roll ZP00003294.
* The Contractor is fully responsible for transportation at ALINVEST’s site and insurance. Contractor is responsible for unloading, handling, and placement of parts over 20 tons at the installation site and their precise alignment and positioning. Manipulation equipment needed for installation of parts over 20 tons is in scope of Contractor.
* Cabling between electrical cabinet, roll grinder and main control pulpit
* Supervision of installation and commissioning within the existing grinding plant.

Additionally, the Client shall:

* Provide the water coolant tank according to the contractor's specifications.
* Provide coolant water according to the contractor's specifications.
* Provide Oils and lubricants according to the contractor's specifications.
* Ensure all civil works required for the installation, strictly following the Contractor’s documentation.
* Provide electrical connection and compressed air supply at the installation site.
* Provide a Jib slewing crane for the installation of the equipment.
* Provide assembly workers and electricians for the installation of the equipment, as specified in a document provided by the Contractor detailing the required skills, number of personnel, and installation procedures.

The Contractor remains fully responsible for:

* Supervision of installation, including technical oversight and quality control.
* Providing detailed installation documentation specifying requirements for assembly workers and electricians.
* Post-installation support, including remote diagnostics and technical assistance.
* Comprehensive warranty, in line with industry best practices.
* Evaluation of factory layout and logistics planning to ensure smooth equipment delivery.
  1. Technical description of grinder

The required machine must be a CNC-controlled cylindrical roll grinder, designed for high-precision grinding of industrial rolls, particularly twin roll casting (TRC) rolls drawing no. 60-10-33x-xxx (in Annex\_6\_Drawings\_of\_rolls) from the new cast house. It must be foundation-free and integrate advanced automation, stability, and accuracy features. The machine structure must ensure that in the event of a power failure, neither the machine nor the workpiece will be damaged. The control unit has to be protected against voltage fluctuations by a UPS.

The whole installation must comply with the noise and hygienic limits (with technological load). The limit of the acoustic pressure level LA must not. exceed 82 dB in the place where the operator will move (measured at a height of 1.2 m above the floor).

* **Machine Type:** CNC Cylindrical Roll Grinding Machine
* **Motion Control:** CNC-controlled all axis movements
* **Workpiece Clamping:** Faceplate drive system with steady rest support covering whole range of grinded roll according to the roll definition described in Table 1
* **Grinding spindle lubrication** must be fully hydrostatic
* **Coolant Filtration:** Integrated high-efficiency filtration unit, installed in a pit below floor level
* Roll Loading Device (Softloader) which prevents damage to the steady rest and its jaws that could be caused by abrupt loading using the factory crane
* **Three-Point Measurement System** for real-time profile accuracy control during grinding (correction on the fly)
* Fully integrated automated Crack Detection integrated into the roll grinder control:
  + **Eddy Current Testing** for surface defect detection, capable of identifying cracks of 2x0.1x0.1, measuring on the fly simultaniosly during grinding.
  + **Ultrasonic Inspection** for internal defect detection.
* The Grinder must be equipped with an OPC interface in the Level 1 control system to enable communication with the OPC server and the **Client’s** MES system. The standard **OPC UA variant** must be used by the **Contractor**.
  1. Technical parameters
* Min. range of ground roll diameters: 150 – 1200 mm
* Min. range of ground roll lengths: at least 5000 mm
* Min. range of ground roll weights at least 22 000 kg
* Min. range of ground roll hardness: at least 440 HB or 100 HSh „D“
* Max. Machine’s tolerance as roundness of ground roll 4 µm
* Max. Machine’s tolerance as cambering for crown  
  height up to 0,1mm of ground roll is 4 µm/m
* Final lowest obtainable roughness of ground roll Ra 0,025 µm
* Max. Machine’s tolerance as conicity (straightness)   
  on grinded roll    4 µm/m
* Max. Machine’s tolerance as eccentricity on ground roll 4 µm/m
* Min. neck diameter 90 mm
* Min. range of rotation speed of headstock 0 - 100 rpm
* Min. range of feedrate in Z-axis 0 - 6000 mm/min
* Min. range of grinding wheel diameters 520 - 914 mm
* Min. range of grinding wheel widths: 80 - 120 mm
* Min. range of cutting speed 0 - 45 m/s

\* Tolerances are referred ot diameter.

1. Training

Staff training will be provided by the Contractor FREE OF CHARGE within the delivery of the grinder.

The training will be divided into three levels, based on the proficiency and complexity of the line/machine:

* Operators
* Maintenance
* Technologist

The training will take place at the Client’s site, in Czech and English. On site training (duration: 5 (five) days) as per during cold and hot commissioning.

All training documents to be provided in DOC and PDF format and hand over in electronic form (USB or CD).

Detailed training schedule will be agreed on at the appropriate time during the project implementation.

To this end, the Client will arrange for an adequate number of interpreters at the appropriate time.

Each training will be documented; an attendance list will be made according to the Client’s internal regulations.

* 1. Operators

The Contractor will compile the training documents (in Czech and English) for the operators, and will train the staff in safety measures and simple maintenance interventions.

The training will cover the following topics:

* Process and procedure
* Tools and changeover
* Maintenance (daily maintenance within the operators’ competence)
  1. Maintenance

This training applies to expert staff, such as electricians, mechanics, tool makers and PLC programmers.

The Contractor will provide general and specialized expertise of the operation as well as experience through this training which will also include recommendations concerning the process technology, working procedures with special oral/written operation and testing specifications, as well as information about specific performance data based on the practice.

The Contractor will prepare the training documents (in Czech and English) for the expert staff.

The training will cover at least the following topics:

* Safety systems at the machinery
* Functional description of electric, pneumatic, hydraulic control (flow chart)
* Maintenance planning and performance
* Troubleshooting, breakdowns. Basic structure of the programmed management process To this end, practical hardware and software training must be provided.
* Setting the technological parameters and effect of their changes.
* Review of available documentation including drawings, instruction manuals, bill of material and spare parts.
* Review of system operation, control, interlocks, sequencing, maintenance and safety via operation and maintenance manuals and drawings.
* Provide suggestions of other pertinent topics related to operating and maintaining the new equipment.