**Technical Specification**

**for the manufacture and supply of mining equipment for shotcreting underground workings for “Kumtor Gold Company” CJSC**

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| **Item No.** | **List of Key Data and Requirements** | **Key Data and Requirements** |
| 1 | Delivery Location | “Kumtor Gold Company” CJSC, Kyrgyz Republic, Balykchy city, Narynskoe Highway, 9. |
| 2 | Customer | “Kumtor Gold Company” CJSC, Underground Mining Division. |
| 3 | General Provisions | The subject of this technical specification is the procurement of one (1) unit of mining equipment intended for the application of wet shotcrete for supporting underground mine workings. The unit must be intended for the application of concrete mixture using the wet-method onto rock surfaces to form a reinforcing support layer. The equipment must be new, not previously used, and not refurbished. |
| 4 | Geometrical Characteristics of Workings | Maximum height:  • Capital workings – 5200 mm  • Operational workings – 4500 mm  Maximum width:  • Capital workings – 5500 mm  • Operational workings – 4500 mm  Minimum outside turning radius – 7400 mm  Minimum inside turning radius – 4000 mm  Maximum decline grade – 15% Road surface – rock. |
| 5 | Environmental Conditions | 1. Elevation above sea level – up to 4000 m.  2. Ambient temperature from –35°C to +40°C.  3. Underground air temperature from +2°C to +5°C.  4. Underground humidity – 70%.  5. Air supply: 20 m³/sec.  6. Water supply – industrial water.  7. Gas contamination – none.  8. Dust level – none. |
| 6 | **Equipment Requirements** |  |
| 6.1 | Technical Specifications | 1.1 Model, brand, and manufacturer – to be determined as a result of the selection.  1.2 Tank volume – to be defined.  1.3 Year of manufacture – not earlier than 2025.  2. Engine:  2.1 Preferred brand: *Mercedes-Benz or Deutz.*  2.2 Fuel: diesel.  2.3 Engine displacement – to be defined.  2.4 Engine power – to be defined.  2.5 Turbocharger – required.  2.6 Turbo-timer (engine/turbo cooling delay system) – required.  2.7 Liquid cooling system.  2.8 Exhaust system – catalytic converter and muffler.  *The engine must be approved for underground mine use. The unit must be adapted for high-altitude operation and equipped with an arctic package. The equipment must be capable of continuous operation, 11-hour shift duration, 365 days a year.* |
| 6.2 | Electrical System Requirements | 1. System voltage – 24 V.  2. Battery pack – minimum 2 units.  3. Yellow flashing beacon – 1 unit.  4. LED parking lights, brake lights, turn indicators, and status indicators.  5. Front and rear lighting – LED.  6. Electrical wiring in non-combustible and waterproof insulation. |
| 6.3 | Chassis | 1. Load capacity – to be determined. |
| 6.4 | Brake System | 1. Service brake: hydraulic dual-circuit closed-type system, multi-disc oil-immersed brakes on both axles.  2. Parking/Emergency brake: spring-applied, hydraulically released. |
| 6.5 | Tires | 1. Single, pneumatic, tubeless tires – 12.00–20 PR 20 (dimensions to be confirmed based on equipment selection).  2. Spare wheel assembly – minimum 1 pc. |
| 6.6 | Steering System | 1. Hydraulic steering with articulated frame, Orbitrol type.  2. Frame articulation angle: ±40° (subject to approval). |
| 6.7 | Transmission | 1. Hydromechanical transmission with hydraulic pump drives.  2. All-wheel drive. |
| 6.8 | Hydraulic System | 1. Variable displacement pumps (steering and boom) – model/brand to be determined.  2. Flow capacity – to be determined.  3. Hydraulic oil tank capacity – as provided by manufacturer.  4. Return-line oil filtration.  5. Indicators for oil level, filtration status, and temperature. |
| 6.9 | Fire Suppression System | 1. Automatic fire suppression system – required.   1. 2. Portable fire extinguishers – required. |
|  | Operator Cabin | 1. Cabin type: enclosed; certified protection against falling objects and rollover (ISO 3449 / ISO 3471), ROPS and FOPS.  2. Driver’s seat: T-shaped backrest, pneumatic suspension, 3-point safety belt.  3. Heating and air conditioning – required.  4. Multifunctional display showing: speed, RPM, engine hours, fluid levels, temperature, pressure, warnings, fault codes, etc.  5. Two rear-view mirrors.  6. Rear-view camera.  Control labels must be in Russian. |
| 6.10 | Lubrication System | Centralized lubrication system. |
| 6.11 | Remote Control | Radio remote control for shotcrete boom.  Two (2) operator joysticks. |
| 6.12 | Shotcrete Boom | Boom rotation angle – 270°.  Boom elevation angle – +75° to –20°.  Boom folding angle – +165° to –60°.  Boom extension – up to 2500 mm.  Nozzle rotation – 420°.  Nozzle inclination – 105°. |
| 6.13 | Main Parameters of Concrete Pump | Shotcreting method – wet mix.  Wear-resistant piston-type concrete pump.  Concrete delivery capacity – not less than 4–20 m³/h.  Maximum aggregate size – up to 10 mm.  Fiber reinforcement use (length 55–65 mm) – supported.  Maximum hose delivery distance – up to 100 m.  Concrete delivery pressure – 5–8 MPa.  Concrete delivery hose diameter – not less than 65 mm.  Maximum application height – up to 10 m. |
| 6.14 | Chemical Admixture System | Chemical admixture tank capacity – 500 L.  Built-in dosing pump for admixture supply (setting accelerator).  Maximum pressure up to 13 bar.  Dosing control with parameter display on the operator screen. |
| 6.15 | Air Compressor | A built-in air compressor must be provided to support wet-mix shotcrete operation.  Industrial-grade compressor suitable for underground mining conditions (high dust, temperature fluctuations, humidity).  Capacity – 8 m³/min.  Working pressure – minimum 7–8 bar.  Compressor with diesel-hydraulic drive.  Optionally, the machine may be equipped with a built-in electric compressor providing equivalent performance (8 m³/min) when connected to a 380 V, 50 Hz power supply. |
| 6.16 | Water Supply System | Equipped with water hose reel.  Hose length – 30–40 m.  A high-pressure washer must be provided for system cleaning after each shift. |
| 7 | Spare Parts and Tools | 1. The Supplier must provide a spare parts kit for 2,000 operating hours.  2. Special service tools for maintenance and repair.  3. Wheel chocks with mounting brackets. |
| 8 | Technical Documentation | 1. The Supplier must provide all accompanying technical documentation (certificates of conformity, technical passports, operation manuals, spare parts catalog, and any other required documentation for safe operation, customs clearance, and registration with government authorities of the Kyrgyz Republic).  2. Operation and maintenance manuals – 2 copies.  3. Spare parts catalog – 2 copies.  4. Documentation in PDF format on USB – 2 copies. 5. Certificate of quality and origin.  *All documents must be provided in both printed and electronic form, in Russian.* |
| 9 | Warranty Period | 1. The Supplier must provide a warranty period of not less than 12 months from the date of commissioning.  2. A service center and spare parts warehouse must be available within the territory of the Kyrgyz Republic.  3. If no service center and spare parts warehouse exist in the Customer’s country, the Supplier must establish the necessary conditions to provide service and technical support locally. The equipment must operate continuously (24/7).  4. The Supplier must conduct training of the Customer’s personnel at the Kumtor mine site. |
| 10 | Equipment Acceptance | Acceptance of equipment by quality and quantity shall be performed at the Kumtor mine site with the participation of the Supplier’s representative. |
| 11 | Commissioning | 1. The Supplier shall bear all costs for any additional work identified during equipment inspection. |
| 12 | Quality Evaluation Criteria | 1. During the warranty period, performance evaluation will be conducted. Performance must comply with the manufacturer’s specifications.  2. If non-conformities are detected, the Supplier shall cover all costs for rectification. |
| 13. | Payment Terms and Delivery Time | 1. Payment terms: according to the Contract.  2. Delivery shall be carried out at the Supplier’s expense and by the Supplier’s means.  3. Delivery terms: for non-residents of the Kyrgyz Republic – DAP; for residents of the Kyrgyz Republic – DDP.  4. Delivery location: Kyrgyz Republic, Balykchy city, Narynskoe Highway, 9.  5. Delivery period: up to 160 calendar days from the date of signing the Contract by the Parties.  6. Assembly and commissioning shall be performed within the timeframes established by the Customer. |
| 14. | Technical Regulations and Standards | The equipment must comply with the requirements of the current Technical Regulation of the Customs Union (TR CU 010/2011) “On Safety of Machinery and Equipment” and other applicable EAEU requirements (if necessary). |
| 15. | Safety | Braking interlock and overload protection systems, fire safety means, and lighting must comply with the technical passports.  All moving parts of the equipment that pose a hazard to personnel must be shielded, except for parts where shielding is not possible due to functional necessity. Protective guards must be supplied complete with the necessary mounting devices. |
| 16. | Note | The requirements specified in this Technical Specification are indicative and may be adjusted during discussion with potential suppliers. |

**Illustrative photo from the internet**

