



Terms of Reference (ToR) for manufacturing of self-propelled underground mining machine (dump truck)

Parameters	
Geometric characteristics of mine workings	
Height of mine working:	3200 mm
Width of mine working:	3400 mm.
Turning width (T-section):	3500 mm
Maximum slope of inclined exit:	14°
Pavement	Rock
Ore and rock properties	
Ore type:	Polymetals
Material density (t/m ³):	2.7
Rock type:	Rheodocites, Quartzites, Tuffs, Agglomerates
Ore hardness: mPa:	5-60
Rock hardness: mPa:	5-120
Fracturing of ore and rocks:	Medium to highly fractured
Abrasiveness of rocks and ores:	Moderately abrasive rocks, ores of medium abrasiveness
Rock and ore strength and stability:	Unstable
Environmental properties	
Air temperature:	15-24°C
Deposit inundation (humidity), %:	50
Air supply: m ³ /min:	6000 m ³
Content of aggressive impurities in water, pH:	5-7
Carbonization:	No
Dust content:	1.6
Type of works	Unloading and transportation of rock mass

MACHINE SPECIFICATION AND EQUIPMENT

Overall dimensions and weight	
Length:	7 900 mm
Body height:	2 200 mm
Width (at wheelbase):	2 100 mm
Unloading height:	4 300 mm

Cabin height:	2 300 mm
Body capacity:	6 m ³
Loading capacity:	15 000 kg
Engine	
Type of engine:	Radiator cooled diesel engine. Diesel emission standards Euro 3, Tier III
Air intake system:	Dry air filter
Exhaust system:	Catalyst, muffler
Starter voltage: 24 V	24 V
Transmission	
Converter (Hydrotransformer):	Single-stage converter with lock-up converter
Transmission:	Hydromechanical gearbox, Four forward and four reverse gears
Axles	
Front axle:	High friction differential
Rear axle:	Balancer. High friction differential
Tires	
Front wheels:	Tire size and type: 14.00 R24 E4
Rear wheels:	Tire size and type: 14.00 R24 E4
Braking system	
Design:	Multidisc spring brake (SAHR)
Service brake: hydraulic dual-circuit brake system of closed design on both axles multi-disc brakes in oil bath.	Hydraulic dual-circuit brake system of closed design on both axles multi-disc brakes in oil bath.
Safety/Parking brake:	Reverse, normally spring-applied, hydraulic disengagement.
Performance	
Max. speed:	(loaded forwards/reverse, on a level road): 1st gear: 4 km/h 2nd gear: 7 km/h 3rd gear: 13 km/h 4th gear: 22 km/h
Maximum gradient:	15°
Turning radius (internal):	3 700 mm
Turning radius (external):	6 300 mm
Steering	
Steering:	Hydraulic steering with articulated frame.
Angle of rotation of the frame joint:	± 42,5°
Body	
Body:	6 m ³ , height: 2 200 mm, maximum useful load: 15 000 t
Electrical system	
Operating voltage:	24 V
Battery:	2 x 12 V
Protection Class:	IP65
Main and rear lights:	LED
Additional headlights and signal lamps:	LED

Sound and light reverse signaling:	Sound and light reverse signaling
Electrical wiring:	Wiring harnesses in fireproof and waterproof casing
Other: Battery switch	Battery switch
Operator's cabin	
Type of operator's cabin:	Open cabin: FOPS / ROPS certificate
Operator seat:	Ergonomic seat with safety belt
Other:	Seat for mine self-rescuer.
Other equipment	
Safety:	Emergency stop buttons on the machine body
Option:	Headlight protection grilles
Lubrication/Greasing system:	Central automated lubrication system
Fire extinguisher:	Portable fire extinguisher 2 x 8 kg
Information plates:	Warning signs (plates) and inscriptions in Russian and English.
Signal lights:	Amber flashing light beacon
Spare tire (with rim):	2 pcs.
Fire extinguishing system:	Fire extinguishing system (manual / automatic) with automatic shutdown
Documentation:	2 operating manuals and spare parts in Russian and English; spare parts catalog on CD.
Emergency braking system:	Hydraulic brake release
Wheel blocks:	With brackets, 2 pcs.
CE certification, ROPS and FOPS certification, Tier 2 for underground works	ROPS and FOPS certification, Tier 2 for underground works.