“Mashprom-Equipment”

Presents:

EQUIPMENT FOR THE MINING INDUSTRY

Mechanized complexes of ore dumping, conveyor equipment, trommels for mills, lining machines, roll crushers, tanks with mechanical mixers, thickeners, tanks, sumps and other equipment for ore-dressing plants.
The main activities of "Mashprom equipment" are the design, manufacture and supply of non-standard equipment and machines for the mining, metallurgical, chemical, oil and gas industry in Russia. The production of the factory includes machinery and equipment, production of which requires a non-standard approach and constructional solutions.

As a basis of our work we are guided by the following principles:
- to meet all the requirements of our customers;
- to comply with the standard ISO 9001-2008;
- to continually update the quality system;
- to comply with industry standards and state standards;
- to maintain a comfortable working environment and improve the welfare of our employees;
- to comply with environmental requirements of production.

"Mashprom-equipment" plant is an enterprise specializing in the design and manufacture of sophisticated equipment for the major industrial sectors of our country.

Our achievements have been made possible primarily thanks to the staff of highly skilled designers and engineers with extensive experience in the best research institutes and design bureaus of defense enterprises of St. Petersburg. Manufacture of machinery and equipment has all necessary machines park for machining of complex parts and components of crushing and screening equipment; welding and assembly of buildings traction and load-carrying mechanisms for conveyors; manufacturing of big volume tanks with mechanical mixers. We are able to attract, under the terms of a mutually beneficial cooperation, enterprises with unique equipment for the production of individual elements of complex process parts for our machines.

Our machines and equipment are operated under hard industrial loads and operate in different weather conditions at the largest enterprises of Russia.

Production of the "Mashprom equipment" plant made under the slogan "constructional solutions".

In this booklet, we present the most interesting projects made for the mining industry.

On the last page of the booklet is a short list of manufactured equipment.
Complex of conveyor equipment "dumping the top" of the stack

**General information:**
Complex of equipment is for the "upper dumping" heap leach piles. Ore from the main conveyor trolley through the overload is applied to steeply inclined loader from which further enters the spreader, which forms a stack width of 70 meters and height of 12 meters.

**The system includes the following equipment:**
- Bulk cargo handling trolley conveyor total length of 1000 meters;
- Steeply inclined loader crawler (angle of ascent ore to 35°) with hanging belt on the roller mount;
- Spreader crawler length of 60 meters.

**Main technical characteristics of complex:**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>250 tons/hour</td>
</tr>
<tr>
<td>Heap stacking width</td>
<td>70 m</td>
</tr>
<tr>
<td>Heap stacking height</td>
<td>12 m</td>
</tr>
<tr>
<td>Speed of conveyor belt</td>
<td>2 m/s</td>
</tr>
<tr>
<td>Width of conveyor belt</td>
<td>1000 mm</td>
</tr>
<tr>
<td>Weight of complex</td>
<td>More than 150 tons</td>
</tr>
</tbody>
</table>
Stacker Radius UNR70

**General information:**
Radius stacker UNR70 is designed to operate as part of a dumping complex is presented as three supports track-mounted inclined conveyor with length of 76 meters and height up to 18 meters. Taking the ore from feeding conveyor it lifts it to a height of 18 meters and discharge directly in the stack.

The system includes the following equipment:
The composition of the product includes the following components and mechanisms:
- Inclined conveyor length of 76 meters, with a slope of 13º, with an electric drive of the main conveyor, capacity of 55kW;
- Pull-out conveyor length of 10 meters, with motion of 6 meters, and power capacity of 11kW.
- The conveyor shifting mechanism with power capacity of 0.75 kW;
- Rear truck-mounted trolley with two separate electric drives for trucks 5.5 kW each;
- The front trolleys, united by one frame with separate electric drives for trucks 5.5 kW each;
- Operator cabin with remote control;
- Supporting steel structures made from sheet and profile rolled steel;
- Service platforms, stairs and ladders.

**Main technical characteristics of complex:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>400 tons/hour</td>
</tr>
<tr>
<td>Heap stacking width</td>
<td>120 m</td>
</tr>
<tr>
<td>Heap stacking height</td>
<td>18 m</td>
</tr>
<tr>
<td>Speed (adjustable) of moving on radius</td>
<td>From 0,3 to 1,0 m/min</td>
</tr>
<tr>
<td>Speed of moving on front</td>
<td>0,85 m/min</td>
</tr>
<tr>
<td>Speed of convoyer belt</td>
<td>2 m/s</td>
</tr>
<tr>
<td>Width of convoyer belt</td>
<td>1000 mm</td>
</tr>
<tr>
<td>Dimensions</td>
<td>76,0 x 11,0 x 19,5 m</td>
</tr>
<tr>
<td>Weight</td>
<td>56 тонн</td>
</tr>
</tbody>
</table>
Conveyer reloader MP

General information:

Reloader is a truck-mounted conveyor on three crawler tracks and is intended for dumping stacks or piles formation, as well as the possibility of a uniform loading of ore on board a scow or vessel in stationary port facilities and shoreline. Reloader moves on crawler tracks.

Two ladle loaders provide ore feed into a hopper feeder plate TK-16A. Feed of ore may also be carried out by feeding conveyors.

Main technical characteristics:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of reloader with pulled-out conveyer</td>
<td>50 m</td>
</tr>
<tr>
<td>Высота над плашкоутом в рабочем положении</td>
<td>5...5,5 m</td>
</tr>
<tr>
<td>Drive of main conveyer</td>
<td>30 kW</td>
</tr>
<tr>
<td>Drive of pulled-out conveyer</td>
<td>7,5 kW</td>
</tr>
<tr>
<td>Drive of pull-out</td>
<td>1,5 kW</td>
</tr>
<tr>
<td>Drive of crawler tracks</td>
<td>4 x 7,5 kW + 2 x 5,5 kW</td>
</tr>
<tr>
<td>Conveyer belt width</td>
<td>650 mm</td>
</tr>
<tr>
<td>Conveyer belt speed</td>
<td>2 m/s</td>
</tr>
<tr>
<td>Capacity</td>
<td>Up to 290 cub.m/hour</td>
</tr>
<tr>
<td>Weight of reloader</td>
<td>55 tons</td>
</tr>
</tbody>
</table>
Conveyor equipment for dumping piles

Complex of conveyor equipment for dumping piles with belt 1000 mm

Bulk Conveyor (belt width 650 mm, length 400 meters)

Belt conveyors of various modifications
Immersible screen PL

**General information:**
Submersible screen is for retaining the activated carbon in the adsorption tank. The pulp enters into the inner space of screen through the screening media formed of slotted grid goes in the housing and spills over into the next tank. Inside the housing of submersible screen is a screw. External cage with blades rotating around a slotted grid prevents the accumulation of coal near the screening media.

Screen is completed by helical gearmotors company «Getriebebau Nord» (Germany), having reinforced bearing assembly and a special design for mixing devices.

Electric control box allows the "start-stop" of screen with light indication of operation mode, provides protection functions against overcurrent, mechanical blocking of gear motor, has protection against exceeding the allowable leakage current, breakage (loss) phase voltage and it has inputs and outputs for connecting the screen in a single process chain.

**Main technical characteristics:**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening media hole size (not more)</td>
<td>0,8 mm</td>
</tr>
<tr>
<td>Screening media square</td>
<td>3,0 sq.mm</td>
</tr>
<tr>
<td>Live section</td>
<td>Not less than 30%</td>
</tr>
<tr>
<td>Drive gear</td>
<td>4 kW</td>
</tr>
<tr>
<td>Shaft rotation speed</td>
<td>28 rot/min</td>
</tr>
<tr>
<td>Dimensions LxBxH (without drive)</td>
<td>800x1150x2250 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>780 kg</td>
</tr>
</tbody>
</table>
Roll crusher DV100

General information:
Roll crusher DV100 is designed for crushing materials of mineral, organic and industrial origin, with a compressive strength of 100 MPa. A distinctive feature is the ability to roll crusher to grind the material prone to sticking. The main operating elements are cylindrical rollers that rotate towards each other and crush the material goes through the feed hopper. Crusher is located on the movable frame, which allows rolling out the crusher from the feeding zone for maintenance and replacement of the crushing segments. The kit comes with MCC with necessary control instrumentation. In this example, a roll crusher, we will show an enlarged order of production of the crushers:

Frame with drive and wheels
Main technical characteristics:

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>100 t/hour</td>
</tr>
<tr>
<td>Drive power</td>
<td>90 kW</td>
</tr>
<tr>
<td>Feed size</td>
<td>250 mm</td>
</tr>
<tr>
<td>Discharge material size</td>
<td>50 mm</td>
</tr>
<tr>
<td>Roller diameter</td>
<td>450 mm</td>
</tr>
<tr>
<td>Roller length</td>
<td>1350 mm</td>
</tr>
<tr>
<td>Compression strength</td>
<td>Up to 100 MPa</td>
</tr>
<tr>
<td>Or by Protodiakonov scale</td>
<td>Up to 6</td>
</tr>
<tr>
<td>Nominal speed</td>
<td>52 rot/min</td>
</tr>
<tr>
<td>Crusher dimensions LxBxH</td>
<td>4300x1500x1200 mm</td>
</tr>
<tr>
<td>Crusher weight</td>
<td>9600 kg</td>
</tr>
</tbody>
</table>
ült Roll crusher DV-10

**General information:**

Roll crushers DV-10 is designed for crushing of various kinds of material such as: granite, quartz, diabase, gabbro, basalt, limestone, dolomite, expanded clay, ferroalloys, metallurgical slag dumps with a compressive strength of 150 MPa.

The main operating elements are cylindrical rollers that rotate towards each other and crush material enters through the feed chute.

**Main technical characteristics:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capacity with CSS 20/10/5mm</strong></td>
<td>30/20/10 cub.m/hour</td>
</tr>
<tr>
<td><strong>Rollers diameter</strong></td>
<td>600 mm</td>
</tr>
<tr>
<td><strong>Rollers length (with liners)</strong></td>
<td>540 mm. Liners - steel 110G13</td>
</tr>
<tr>
<td><strong>Rollers can be adjusted inside the range (dimension between rollers)</strong></td>
<td>from 40 to 2mm</td>
</tr>
<tr>
<td><strong>Rollers speed</strong></td>
<td>150 rot/min</td>
</tr>
<tr>
<td><strong>Drive power</strong></td>
<td>2x11 kW (NORD)</td>
</tr>
<tr>
<td><strong>Feed size</strong></td>
<td>from 60 mm</td>
</tr>
<tr>
<td><strong>Discharge material size</strong></td>
<td>Up to 0,1 mm</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>3270x1543x882 mm.</td>
</tr>
<tr>
<td><strong>Crusher weight</strong></td>
<td>3040 kg</td>
</tr>
</tbody>
</table>

To check the results of crushing we took samples of various materials with different hardness. The main objective was to determine the output size fractions of crushing material by using the RCS between the rollers 2.5 mm. Size of material inlet 40-10 mm fraction output 3-0,1mm

**Pictures of various materials crushing:**

Granite screenings  
Ferroalloys  
Expanded clay
Roll crusher DV5T

**General information:**
Roll crusher DV5T designed for crushing hard materials with a compressive strength of 200 MPa.
The crusher consists of the following components: body, two crushing rollers with removable toothed segment, the two geared motors 4 kW each, connected via a coupling to the crushing rolls.
Crushing of material is carried out during compression and shearing of the material between the toothed segments.

**Main technical characteristics:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>5 t/h</td>
</tr>
<tr>
<td>Drive</td>
<td>МЦ 2СФ-100-56-56-5,5-310Ц-У2</td>
</tr>
<tr>
<td>Feed size</td>
<td>50 mm</td>
</tr>
<tr>
<td>Receive opening size</td>
<td>855x518 mm</td>
</tr>
<tr>
<td>Moment on output shaft</td>
<td>670 N*m</td>
</tr>
<tr>
<td>Crusher dimensions LxBxH</td>
<td>1845x1225x500mm</td>
</tr>
<tr>
<td>Crusher weight</td>
<td>1800 kg</td>
</tr>
</tbody>
</table>

Roll crusher DV400

**General information:**
Toothed roll crusher DV400 operates as part of the crushing and grinding complex and is designed to crush hard materials with a compressive strength of 200 MPa.
Crusher is installed on the movable frame, which allows to roll out the crusher from the hopper zone for maintenance and replacement of the crushing segments.

**Main technical characteristics:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>400 t/h</td>
</tr>
<tr>
<td>Drive power</td>
<td>2x90 kW</td>
</tr>
<tr>
<td>Feed size</td>
<td>Not more than 250x250x250 mm</td>
</tr>
<tr>
<td>Discharge material size</td>
<td>25-50 mm</td>
</tr>
<tr>
<td>Nominal speed</td>
<td>93 rot/min</td>
</tr>
<tr>
<td>Crusher dimensions LxBxH</td>
<td>4000x2000x1000 mm</td>
</tr>
<tr>
<td>Crusher weight</td>
<td>12000 kg</td>
</tr>
</tbody>
</table>
Mashprom-Equipment vibrating feeders

General information:
"Mashprom equipment" produces vibrating feeders for various industries. Vibrating feeders are used for uniform supply of bulk materials from the hopper (bunker vibrating feeders) or silos. Vibrating feeders of our production are designed for uniform material feed with size of up to 300mm.

Vibrating feeder VPS-900

Current type of vibrating feeder is suitable for uniform supply of bulk material. As a rule, this type of vibrating feeder is used where is no need to carry out additional screening of material.

Vibrating feeder VPK-900

Its special feature is the presence of the output tray stages in the form of "dovetail." Availability of cascades allows to obtain a homogeneous product fraction in a given range. This is especially important for companies where the transportation process of the raw material goes through several stages of transfer, transport and storage.
Vibrating feeder VPP-700

Examples of modernizations of enterprises by the equipment made by Mashprom-Equipment.
Mills lining machine

**General information:**

Lining machine (hereinafter - the "LM") is designed for mechanization of loading and unloading works, positioning and accurate installation of liners during repair work on the replacement of the metal lining in the mill. LM is installed on rails, moves on them using its own drive. Upon reaching the mouth of the mill LM is locked to the rails screw terminals from tipping over.

This modification of the LM is with hydro mechanical turning seizure is a modernized version of the LM. It allows you to position the liner inside the mill.
By use of a hydraulic drive in the carriage of LM (where the crane-manipulator unit is installed) is coming into a working area of the mill, (hereinafter - "CMU"). Motorized trolley supplies and remove the worn lining in the working area of the CMU.

**The minimum diameter of the hopper 1100mm**

Controlling of all operations of LM is done from a stationary or remote control panel.

In case of your interest to the lining machine, we are ready to send you a special presentation, which described in detail all the competitive advantages of our LM in comparison with similar foreign-made machines, with the price and technical characteristics.
Agglomerators of different modification
Agglomerators with length from 6 to 24 m, diameter from 1.5 to 2.8 m (capacity up to 520 tons/hour).

Tanks with volume from 7 to 1200 cub.m with mechanical mixers
Tanks of different modification

Tank V=25 cub. m with support frame for mechanical mixer installation

Sorption column V=25 cub. m

Hydrocyclons feed pumps sump with rubber liners
Tanks made of 09G2S (steel) with insulation made of PPU for northern areas

Tanks made of steel AISI 316Li for storage of aggressive materials

Fire tank made of steel 12X18H10T type 5.904-43

Hoppers for bulk materials with Hardox 450
Horizontal and vertical tanks of different modifications and volumes

"Mashprom equipment" produces large-sized tanks for the mining industry such as flotation columns, lamellar and centrifugal thickeners.

Flotation Column - manufacturing and control assembly (last photo – as installed at Customer site).
Lamellar thickener Ø12m – manufacturing process and control assembly (last photo – as installed at Customer site).

Mills trommel made by Mashprom-Equipment

"Mashprom equipment" designs and manufactures self-reversed trommels AG Mills. Self-reversed trammel is used in mills of AG and SAG type and designed to return a large fraction of the ore back to the mill for regrinding. Today we make retractive Butare for mills: AG 7,0x2,3A; AG 5,4x3,6; SAG 7,3x5,4; SAG 5,5x1,8.
We use the following quality control methods in our work: ultrasonic inspection, dye penetrant, as well as standard control methods, such as Visual and Dimensional test and inspection of welds on small-tightness capillary method kerosene.
"Mashprom equipment" specializes in solving non-standard problems and is ready to offer for your company Constructive Decisions.

Design, manufacture and supply to you necessary machines and equipment, with relevant parameters for your company and project requirements.

We guarantee:

♣ The individual approach to each customer
♣ High-quality products at a competitive price
♣ Timely delivery anywhere in Russia

Our experts will advise you on the selection of a conveyor, tanks, crushing and screening equipment for mining, processing and preparation plants, as well as help to make the technical task for design and production work.

For more information about our machines and equipment you can get by visiting our website www.mpoltd.ru

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Short list of equipment designed
and manufactured by "Mashprom equipment" for Mining and Processing plants.

Feeding and receiving units
Chutes with liners
1. Crushers feed chutes
2. Containers feed chutes
3. Sluice feeders chutes
4. Reloading chutes
5. Reloading chutes with gate valve
6. Reloading chutes with manual transmission
7. Spillage chutes
8. Unloading chutes
9. Unloading chutes with gate valve
10. Funnel for unloading coal
11. Funnel for unloading balls
12. SAG mills feeding funnels
13. Apron feeders spillage funnels
14. Inertial screen unloading funnels
15. Mills drains funnels
16. Funnels two, three bags with gate valves (can be lined)
17. Tails thickeners feed box V = 3-4 cub. m
18. Leaching tanks feed boxes with liners V = 3-5 cub.m
19. Samplers boxes V = 0,25 cub. m
20. Mills feeding boxes

Hoppers up to V=30 cub. m
1. Undersized product hoppers (can be done with liners 60G2S)
2. Hoppers-mixers
3. Cyanide unloading hoppers
4. Hopper-accumulator with partial lining
5. Hopper-chopper with partial lining
6. Trommels, reversed trommels for mills ∅ 5,5 7,2 m (steel or PU mesh)
7. Screen oversized material chutes
8. Ball mill ∅ 3,6x4,0 unloading chutes
9. Ball mill ∅ 4,0x5,5 unloading chutes
10. SAG mill unloading chutes

Tanks and vessels
1. Water tanks for coil washing V=2-5 cub.m
2. Leaching tanks with mechanical mixers and liners from V=200 cub.m to V=1250 cub.m
3. Demineralized water tanks from V=100 to V=400 cub.m
4. Acid treatment tanks (stainless steel, titanium) V = 16, 25,63 cub.m
5. pH adjustment tanks with mechanical mixer V=100, 150 cub.m
6. Saturated coil tanks with mechanical mixer V=4, 6 cub.m
7. Demetallized solution (fiberglass) tank V=400 cu.b.m
8. Recycled water tanks from V=100 to 400 cu.b.m
9. Merrill-Crowe feeding tanks V = 400 cu.b.m
10. Thickener feeding tanks V=200,300 cu.b.m
11. Filters feeding tanks (possibly with mechanical mixer) V = 100, 125, 160, 260 cu.b.m
12. Potable water tanks V=100 cu.b.m
13. Heated water tanks V=100 cu.b.m
14. Lime milk preparation tanks with mechanical mixer V=6 cu.b.m
15. Alkali solution preparation tanks with mechanical mixer V= 63, 100 cu.b.m
16. INCO process tanks with mechanical mixer V=280 cu.b.m
17. Washing water tanks V=60 cu.b.m
18. Gus purifying tanks
19. Undersized product collection tanks
20. Lime milk drain tanks V=4-6 cu.b.m
21. Clarifier drain tanks
22. Saline tanks V=50 cu.b.m
23. Technical water tanks from V= 100 to 400 cu.b.m
24. Filtrate tanks (possible with mechanical mixers and liners) from V=10 to V=60 cu.b.m
25. Hot water storage tanks
26. Xanthate solution storage tanks
27. Copper sulfate Solution storage tanks (plastic) V=12 to V=25cu.b.m
28. Alkaline solution storage tanks V=100 cu.b.m
29. Samplers tanks V=0,25 cu.b.m
30. Flushing water tanks
31. Different tanks V=10 to V=400 cu.b.m

**Sumps with linings from 2 to 30 cubic meters.**
1. Mill feeding sump V = 7,5 cu.b.m
2. Sump for pumps 3C-AHF
3. Sump for pumps 4D-AHF
4. Sump for pumps 6E-AHF
5. Sump for feeding pumps
6. Sump for feeding pumps of hydrocyclones stage 2
7. Sump for feeding pumps of hydrocyclones stage 3
8. Sump for feeding pumps of hydrocyclones stage 4
9. Sump for feeding pumps of screens
10. Sump for feeding pump for thickeners
11. Sump for pumps of middlings of 1 stage rewash
12. Sump for flotation pumps
13. Sump for gas purification pulp
14. Sump for drains of thickener
15. Sump on drain fourth classification

**Products of various purpose**
1. Steel structures under the sorption column
2. Crushers maintenance platforms
3. Pallets for transportation of precipitate
4. Support frames for air filters
5. Frames for pumps
6. Drive frame for apron feeder
7. Dispenser box sections
8. Rotary tables
9. The sides of the boot of apron feeders (alloy steel lining, thickness 30-40mm)
10. Drums for roller mill ∅ 2,2, ∅ 2,4, ∅ 2,8 meters
11. Drums for ball mills ∅ 5,5 meters
12. Drive for ball mills (with the gear shaft bearing and couplings)
13. Rollers for roller mills
14. Ball charging container in Kibble
15. Ball charging container in the SAG mill
16. Ball charging container in the ball mill
17. Kibble
18. Feed unit for ball mill ∅ 3,6x4,0
19. Feed unit for ball mill ∅ 4,0x5,5
20. The shafts up to 6 meters with polishing
21. Shafts for screw-gear crushers
22. Feeding bushings
23. Unloading bushings
24. The hydraulic elevator for transferring coal with a conical transition (stainless steel)
25. Details to the irrigation system of the leaching solution
26. Carousel molds for ingots
27. Transition ducts
28. The cassettes for unloading coal transported
29. Taper transitions
30. The mechanical mixing device for tanks from 10 to V = 1250 cub.m
31. Umbrellas rotary exhaust
32. Lining bolts for mills (M36, M42, M48, length from 150mm up to 800mm)

**Mechanized systems and equipment for special purposes**
1. Agglomerators from 150 to 520 tons / hour.
2. Columns sorption with baskets of stainless steel V = 25 cub.m
3. Jaw crushers, roll with capacity from 3 to 400ton / hour
4. Conveyers with length from 10 to 500 meters with angles from 0 to 35 degrees (steeply inclined with outboard belt) with belt width from 650 to 1400 mm.
5. Trunk conveyor reloading carts
6. Complexes with dumping height of 18 meters and width 120 meters (base)
7. Transfer conveyor  
8. Dry apparatus for concentrate V = 7,5 cub.m  
9. Equipment for unpacking of "Big Bag" soft disposable containers  
10. Equipment for unloading barrels  
11. Tipping of trolleys  
12. The hydraulic elevator for transferring coal  
13. The flushing device for washing and dressing of aerated sand  
14. Immersible screen to keep activated carbon in adsorption tank  
15. Lining machine for mills

Totally, portfolio of company contains about 700 units of designed and manufactured equipment with developed technical documentation for the mining industry.