



**NIPIGORMASH**



**MODULAR  
PORTABLE EMULSION PLANT FOR THE  
MANUFACTURE OF EMULSION EXPLOSIVE  
COMPONENTS (MMTL)**



## ABOUT COMPANY

NIPIGORMASH has a long history in providing equipment and skilled services to the mining industry. With its head office in Yekaterinburg, Russia, NIPIGORMASH was established in 1958 and has over the years become one of the Russian's leading mining equipment manufactures. We design and build high quality and competitively priced equipment to the explosive sectors. The extensive range of products includes Mixing-Charging Trucks (MCT), loading and hauling equipment, drill rigs, track repair equipment, railway construction & maintenance machines, main mine ventilation fans & booster fans, tunneling systems and Modular Portable Emulsion Plants MMTL.

Our design/engineering department can assist the customer with planning of equipment, best fitted to their needs. The product is manufactured in our own factory. Experienced field service provides technical support and pre-commissioning activities.



## NIPIGORMASH FIELD SERVICE



**OUR SERVICE TEAM IS A SELECT GROUP OF HIGHLY EXPERIENCED INDUSTRY PROFESSIONAL TECHNICIANS SKILLED TO PROVIDE MAINTENANCE AND REPAIR SERVICES FOR\*:**

- MODULAR PORTABLE EMULSION PLANTS MMTL
- MIXING-CHARGING TRUCKS (MCT)
- MAIN MINE VENTILATION FANS & BOOSTER FANS
- TUNNELING SYSTEM



### **EQUIPMENT REPAIR**

Request can be completed for **a single repair** as well as for **a full range** of services - 6 months or a year.

\* NIPIGORMASH mining equipment only

The Equipment Repair Request form should be completed and submitted to NIPIGORMASH service department by fax number **+7 (343) 256-87-49** or by e-mail **servis@npgm.ru**. You can also phone by **+7(343) 256-87-55** and get expert advice about technology and equipment.

Download Equipment Repair Request Form on our web-site **www.npgm.ru**



### OUR CUSTOMERS:

- UGMK
- EVRAZ
- POLYMETAL INTERNATIONAL PLC
- POLYUS GOLD
- THE GOLD MINING COMPANY UGK
- ALROSA
- NORDGOLD
- SUEK
- BOGATYR KOMYR
- SSGPO



### KEY BENEFITS:

- **55 YEARS**  
experience in design, manufacturing and commissioning of mining equipment.
- **EXPERIENCED FIELD SERVICE TEAM**  
(mechanics, hydraulic, electrical engineering, electronics).
- **MODERN EQUIPMENT**  
for diagnostics and repair.
- **WAREHOUSE FOR SPARES**  
is available.

## CONSTRUCTED WORKS

We offer a full range of drilling and blasting services on own production equipment.

## MODULAR PORTABLE EMULSION PLANT MMTL FOR THE MANUFACTURE OF EMULSION EXPLOSIVE COMPONENTS



### MODULAR PORTABLE EMULSION PLANT IS CAPABLE OF:

- receiving, preparation and refining of primary components into non-explosive semi-finished products of emulsion explosives;
- preparation of emulsion and other emulsion explosive components;
- loading of explosive components in Mixing-Charging Trucks (MCT);
- production of «mixed on the job» blasting agents.

### A COMPLEX SUPPLY INCLUDES:

- Mixing-Charging Trucks (MCT), producing different types of commercial explosives;
- the necessary equipment for production of emulsion explosive components;
- preparation of technical permission required for fulfilling explosive works;
- project documentation for Hazardous Industrial Facility (HIF).



## KEY BENEFITS:

- major construction work is not required;
- highly inflammable liquids are not in use;
- an automatic control system providing a 24 hour production;
- energy costs reducing by an induction heater with a high efficiency;
- phased production increase is possible;
- providing comprehensive raw material components supply chain for the enterprises, constructed with the use of the technology developed by NIPIGORMASH, and of spare parts for the technological equipment, MCT and Modular Portable Emulsion Plant MMTL;
- emulsion plant is delivered ready to operation;
- cost effective blasting by cutting down costs for explosives production.

## THE IMPLEMENTED PROJECTS:

- THE GOLD MINING COMPANY (UGK), THE CHELYABINSK REGION

## PROJECTS IN THE IMPLEMENTATION PHASE:

- ALROSA
- ARTEL STARATELEY «AMUR»  
[«PLATINUM GROUP METAL»),  
Khabarovsk Krai
- TIMAN BAUXITE (RUSAL),  
THE REPUBLIC OF KOMI
- URALVZRYVPROM,  
THE SVERDLOVSK REGION

## COMPONENTS AND TYPES OF MODULAR PORTABLE EMULSION PLANTS

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MMTL is built to fit into standard-size containers to facilitate transportation to and installation at remote sites. Each unit is equipped with an environmental and lighting system, as well as a security and fire alarms set.

Modular Portable Emulsion Plants can be equipped with:

- ▶ a cartridge production **UNIT OF DIFFERENT DIAMETERS;**
- ▶ special equipment for **EMULSION EXPLOSIVE COMPONENTS PRODUCTION;**
- ▶ preparation unit for safety emulsions (3-5 classes), which is used in gas and dust hazardous **UNDERGROUND MINES.**

Modular portable emulsion plant MMTL 500 includes:

- ▶ ANS (Ammonium Nitrate 80% Solution) production module (3,5 t/h)
- ▶ fuel phase production module (10 t/h)

The plant can be retrofitted with additional modules, when needed, **ALLOWING IT TO INCREASE THE EMULSION PRODUCTION CAPACITY.**

One emulsion module can keep several ANS modules busy.

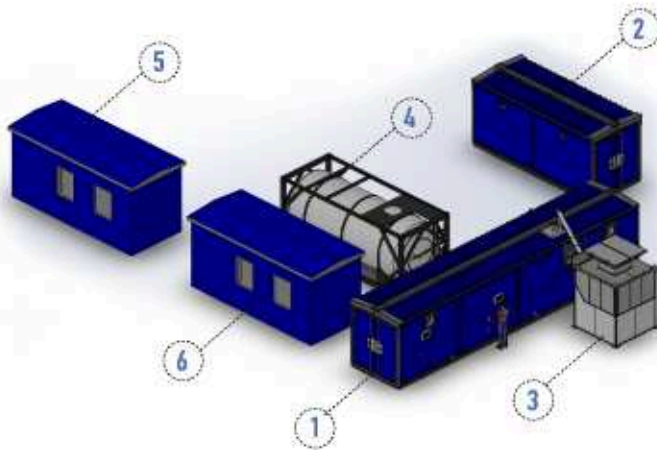
ANS can be heated by steam or hot water.

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## COMPONENTS AND TYPES OF MODULAR PORTABLE EMULSION PLANTS



The process equipment  
will be pre-fabricated and delivered  
in modular sections:

ISO 40F, 12200×2550×2800 mm (L×W×H)  
ISO 20F, 6200×2550×2800 mm (L×W×H)

Modular Portable Emulsion Plant  
MPEP consists of:

- 1 - emulsion/ ANS (Ammonium Nitrate 80% Solution)/fuel phase production module
- 2 - GGA (Gas-Generating Additives) and hot water production module
- 3 - Ammonium Nitrate bin with auto feed system
- 4 - emulsion storage tank (22m<sup>3</sup>)
- 5 - administrative module with control panel
- 6 - laboratory module

### Plant Capacity/Capability/Availability

| MAIN TECHNICAL PARAMETERS   | MMTL 250<br>1-stroke | MMTL 250<br>2-stroke | MMTL 500<br>2-stroke |
|---|----------------------|----------------------|----------------------|
| Total electricity consumption, kWh  | 450                  | 450                  | 800                  |
| Production capacity in hours, t/h   | 1,40                 | 1,85                 | 3,63                 |
| Daily production capacity, t/d<br>(3 shifts, 8 hours a day)                       | 27                   | 36                   | 69                   |
| Annual production capacity, t/year<br>(300 working days, 3 shifts, 8 hours a day) | 8 100                | 10 800               | 20 700               |

# OUR TECHNOLOGY OF «NPGM» PRODUCTION

An emulsion explosive «NPGM» successfully passed industrial tests and was allowed for permanent use.

## FEATURES

- water resistance;
- used in hard ground conditions;
- different formulations for different condition of ground (fissile rock mass or fractured rocks).

## PERMISSION DOCUMENTATION



## MAIN PHYSICAL-CHEMICAL AND EXPLOSIVE PROPERTIES OF «NPGM»

| PROPERTIES   | For NPGM of types "A", "B" according to different marks   |                   |                   |                   |                   |                   |
|--|---|-------------------|-------------------|-------------------|-------------------|-------------------|
|  | "A"-100<br>"B"-100  | "A"-75<br>"B"-75  | "A"-170<br>"B"-70 | "A"-50<br>"B"-50  | "A"-30<br>"B"-30  | "A"-25<br>"B"-25  |
| <b>1. Calculated</b>   |   |                   |                   |                   |                   |                   |
| 1.1 Oxygen balance, %  | -8,69   | -1,55             | -0,11             | +5,56             | +11,3             | +12,7             |
| 1.2 The heat of explosion, kcal/kg   | 558   | 689               | 716               | 616               | 511               | 484               |
| kJ/kg  | 2335,5  | 2879              | 2993              | 2577              | 2136              | 2025              |
| 1.3 Volume concentration of energy, kkal/dm <sup>3</sup> with a density from 1,05 to 1,25g/sm <sup>3</sup> | 586...697   | 723...861         | 751...895         | 646...770         | 536...643         | 508...605         |
| 1.4 TNT equivalent   | 0,586...<br>0,697   | 0,723...<br>0,861 | 0,751...<br>0,895 | 0,646...<br>0,770 | 0,536...<br>0,643 | 0,508...<br>0,605 |
| 1.5 Specific volume of explosive gases, L/kg   | 1059  | 1015              | 1000              | 995               | 988               | 987               |
| 1.6 Toxic fumes volume [CO], L/kg  | 35  | 8,7               | 3                 | 18                | 30                | 50                |
| 1.7 Temperature of explosion products, K   | 2142  | 2430              | 2498              | 2327              | 2136              | 2035              |
| 1.8 Detonation pressure, kbar  | 26,263  | 28,94             | 29,37             | 34,78             | 25,80             | 21,90             |
| <b>2. Experimental</b>   |   |                   |                   |                   |                   |                   |
| 2.1 Density, g/m <sup>3</sup> in 30 min after GGA  | 1,05-1,25   | 1,05-1,25         | 1,05-1,25         | 1,24              | 1,32              | 1,28              |
| 2.2 Velocity of detonation in 240 mm cartridge, km/s   | 5,4   | 5,1               | 5,0               | 4,9               | 4,2               | 4,5               |
| 2.3 Impact sensitivity according to GOST 4545-88:<br>• lower limit, mm<br>• explosion frequency %          | 500<br>0  |                   |                   |                   |                   |                   |
| 2.4 Friction sensitivity   | above 300   |                   |                   |                   |                   |                   |
| 2.5 Heat sensitivity [DTA method]  | Show no exothermic decomposition up to 170°C,<br>intensive exothermic decomposition at 200-220°C. |                   |                   |                   |                   |                   |
| 2.6 The sensitivity to primary means of initiation   | non sensitive   |                   |                   |                   |                   |                   |

Located in Yekaterinburg, Russia, NIPIGORMASH has been providing superior solutions to our customers for over 50 years. We have designed and manufactured a wide range of equipment for the explosives and mining industry. Our design/engineering department can assist the customer with planning of equipment, best fitted to their needs. The finished product always exceeds the required standards and national regulations.

We manufacture and supply:

- ▶ Modular Portable Emulsion Plants MMTL for the manufacture of emulsion explosive semi-finished products
- ▶ Mixing-Charging Trucks
- ▶ Tunneling systems
- ▶ Track repair equipment
- ▶ Main mine ventilation fans & booster fans
- ▶ Loading and hauling equipment
- ▶ Railway construction & maintenance machines
- ▶ Mining drilling rigs
- ▶ Dust exhauster and other equipment



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