








NOVOKRAMATORSKY MASHINOSTROITELNY ZAVOD **LIST OF PRODUCTS AND SERVICES**



-  MINING EQUIPMENT
-  COAL INDUSTRY MACHINE-BUILDING
-  METALLURGICAL EQUIPMENT
-  ROLLING-MILL EQUIPMENT
-  PRESS-AND-FORGING MACHINERY
-  HOISTING-AND-CONVEYING EQUIPMENT
-  POWER-GENERATING EQUIPMENT



NKMZ



1 MINING
EQUIPMENT



2 COAL INDUSTRY
MACHINE-BUILDING



3 METALLURGICAL
EQUIPMENT



4 ROLLING-MILL
EQUIPMENT

5 ROLLING-MILL
ROLLS

6 PARTS FOR POWER-GENERATING
EQUIPMENT AND TRANSMISSIONS



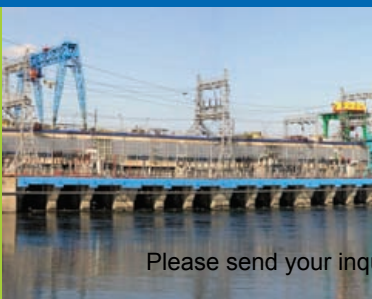
7 PRESS-AND-FORGING
MACHINERY



8 HOISTING-AND-CONVEYING
EQUIPMENT

9 RAILROAD EQUIPMENT
AND SPECIAL-PURPOSE
MACHINERY

10 REDUCTION GEARS AND GEAR
TRANSMISSIONS



11 HYDRAULIC STRUCTURES
FACILITIES

PRODUCTS OF THE COMPANY

DEAR SIRSI!

The largest in Ukraine and world-known manufacturer of unique high-duty rolling, iron and steel, press and forging, hydrotechnic, mining, handling and special-purpose machinery Joint Stock Company «Novokramatorsky Mashinostroitelny Zavod» invites you to mutually beneficial business cooperation.

Historic mission of «NKMZ» is provision with equipment for the basic branches of industry from mining operations to engineering output, satisfaction of wants of the most exacting customers, solving their problems aimed at increase of efficiency of technological cycles and reduction of outlays for output of products. «NKMZ» personnel follows traditions of high responsibility and reliability continuously improving in technologies and professionalism.

Since September 1934 «NKMZ» has designed and manufactured more than 100 rolling mills, 189 mixers for cast iron storage and transportation, 47 die forging hammers, 20 plants for surfacing the blast furnace bells and hoppers, 165 presses of different purpose and capacity, 17 machines for removing slag from cast-iron ladles, 107 horizontal forging machines, more than 2000 walking draglines, more than 2000 mine hoisting machines, about 3000 ore and coal grinding mills, 18 bucket wheel excavators and mining complexes. Participation in the defense and space programs of the Soviet Union gave designing engineers and process staff of «NKMZ» invaluable experience of use of high technologies.

«NKMZ» develops new products release continuously. Recently «NKMZ» has been producing continuous casting machines, ladle-furnace units, arc furnaces, road headers and winning machines, drilling rigs, various handling equipment.

«NKMZ» is the first-rate supplier of rolls for rolling mills, custom-made castings and forgings.

Powerful manufacturing, scientific-research and experimental facilities, advanced technologies and skilled personnel enable the Works to produce integrated equipment of high quality and in a short period of time, to maintain their good long-term operation at the Customer.

Since 1994 the quality assurance system has been developed and introduced at the enterprise. It covers the whole production complex: from marketing research to installation and after-sales service. The quality management system guarantees manufacturing of the high-quality products and meets the requirements of International Standard EN ISO 9001:2008, that has been confirmed by the certificate in the TUV International Certification system (TIC) issued by the international certification authority TUV Thuringen (Germany) and certificate of the national certification authority "STANKOSERT" (Ukraine).

«Novokramatorsky Mashinostroitelny Zavod» - is a world - famous company. Our machines and equipment work in more than 50 countries of the world, including Russia, Japan, Germany, France, Italy, Canada, USA.

We are ready to make a contract for their designing, manufacturing and delivery. Our Experts will give detailed information and consultations. We are ready to consider any inquiry beyond the scope of our standard supplies.

Contact us and you'll find a reliable business partner.

Marketing Department

OUR UNIQUE CAPABILITIES, INTELLECT, HIGH TECHNOLOGIES -
ARE AT YOUR SERVICE!

WE OFFER A COMPLETE RANGE OF ENGINEERING, MANUFACTURING,
DELIVERY AND MODERNIZATION

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AS WELL AS INDUSTRIAL SERVICES

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1. MINING EQUIPMENT

Walking draglines excavators*

- 1.1 ЭШ-6.5/45-Y-M Single-bucket excavators (Walking dragline excavators with bucket capacity - 6.5 cu.m; boom length – 45 m.).
- 1.2 ЭШ-11/70-Y Single-bucket excavators (Walking dragline excavators with bucket capacity – 11 cu.m; boom length – 70 m.).
- 1.3 ЭШ-11/70-П Single-bucket excavators equipped with facility for aiming loading on transport means.
- 1.4 ЭШ-14/50-Y Single-bucket excavators (Walking dragline excavators with bucket capacity – 14 cu.m; boom length – 50 m.).
- 1.5 ЭШ-14/50- П Single-bucket excavators equipped with facility for aiming loading on transport means.
- 1.6 ЭШ-15/80 Single-bucket excavators (Walking dragline excavators with bucket capacity – 15 cu.m; boom length – 80 m.).
- 1.7 ЭШ-15/90 single-bucked excavators (Walking dragline excavators with bucked capacity 15 cu.m; boom length 90 m.).
- 1.8 ЭШ-20/65 Single-bucket excavators (Walking dragline excavators with bucket capacity – 20 cu.m; boom length –65 m.).
- 1.9 ЭШ-10/100 Single-bucket excavators (Walking dragline excavators with bucket capacity –10 cu.m; boom length – 100 m.).

Bucket-wheel excavators

- 1.10 Stripping bucket-wheel excavator ЭШП-1600, theoretical output 5000 cu.m/hr in friable mass.
- 1.11 Stripping bucket-wheel excavator ЭШП-5000, theoretical output 5000 cu.m/hr in friable mass.
- 1.12 Mining bucket wheel excavator ЭШД-5000, theoretical output 5000 cu.m/hr in friable mass.
- 1.13 Stripping bucket-wheel excavator ЭР-5250, theoretical output 5250 cu.m/hr in friable mass.
- 1.14 Mining bucket wheel excavator ЭШД-5250, theoretical output 5250 cu.m/hr in friable mass.
- 1.15 Bucket wheel excavator with advanced digging force ЭШРП-5250, theoretical output 5250 cu.m/hr in friable mass.

Spreaders

- 1.16 Spreader, type ОШ-1600/110, theoretical handling capacity in friable mass 1600 cu.m/hr, dumping radius 110 m.
- 1.17 Spreader, type ОШ-4500/90, theoretical handling capacity in friable mass 4500 cu.m/hr, dumping radius 90 m.
- 1.18 Spreader, type ОШ-4500/180, theoretical handling capacity in friable mass 4500 cu.m/hr, dumping radius 180 m.
- 1.19 Spreader, type ОШ-5000/190, theoretical handling capacity in friable mass 5000 cu.m/hr, dumping radius 190 m.
- 1.20 Spreader, type ОШ-5250/190, theoretical handling capacity in friable mass 5250 cu.m/hr, dumping radius 190 m.
- 1.21 Spreader, type ОШ-7000/190, theoretical handling capacity in friable mass 7000 cu.m/hr, dumping radius 190 m.
Design and manufacture according to the Customer's performance specifications.

*Note: on the Customer's request excavators can be supplied with driving mechanisms:

DC driving mechanisms as per systems "generator-motor", generators driven by thyristor converters or magnetic amplifiers;

AC driving mechanisms controlled by frequency converters, 'frequency changer- asynchronous motor' system

DC driving mechanisms as per "thyristor converter- motor";

With operational parameters for any mining and geological conditions of the open cast.

Belt Conveyors

- 1.22 Belt conveyors КЛ-8000 (mobile and stationary), belt width 800...2000 mm designed, designed to convey soft, bedrock and other rocks and mineral resources.
- 1.23 Stationary belt conveyors with capacity up to 1200t/hr.
- 1.24 High-angle conveyors with pressure belt, with capacity up to 3500t/hr.
- 1.24.1 High-angle belt conveyors with hoisting height 270m by the angle of transportation 37o with capacity 3500 t/hr.
- 1.25 Belt retractable reversible conveyors with capacity up to 4500 t/hr.

- 1.26 Conveyor equipment for conveyors with belt width B=800...2000mm including drives, drums, rollers, bridle units.
- 1.27 Rollers for belt conveyors, belt width from 800...2000 mm.
- 1.28 Feed aprons
Capacity – up to 1700 cu.m/hr.
Belt width – up to 2400 mm.
Length – 4,5...18 m

Facilities for Stockyard

- 1.29 Bucket-wheel crawler reclaimer ЗРГ-1200, theoretical mass capacity 1200 t/hr.
- 1.30 Bucket-wheel reclaimer ЗРГ-1000, theoretical mass capacity 1000 t/hr.
Design and manufacture of drum-type blending plants for ore and coal, bucket-wheel stacker-reclaimers according to the Customer's performance specifications
- 1.31 One-boom nonrotatable stacker У1СН-1000, theoretical mass capacity 1000 t/hr.
- 1.32 One-boom nonrotatable stacker У1СН-5000, theoretical mass capacity 5000 t/hr.

Stationary, semistationary and self-propelled feeder-breakers

- 1.33 Rock crushing units on the basis of pneumohydraulic hammer with blow energy of 100kJ.
- 1.34 Semistationary crushing units on the basis of crusher – ККД – 1500/180ГЩ
- 1.35 Semistationary feeding-breaking units ДПУ-2000/1200К on the basis of crusher КВКД-1450/180.
- 1.36 Semistationary crushing units ДПУ-2000/1200-Ш on the basis of crusher – ДШЗ – 1000/320-1.
- 1.37 Self-propelled feeding-breaking units ДПА-2000 on the basis of crusher КВКД-1450/180.

Note: below see data on crushers

Crushers:

- 1.38 Cone crushers and cone-roll crushers.
Coarse crushing
Cone roll crushers КВКД-1450/180 for primary crushing.
Capacity – 2000 cu m/hr;
Compressive strength of rock bulk - up to 250 MPa;
Feed size - up to 1200 mm;
Discharge opening width – 180 mm (opening can not be adjusted).

Coarse cone crushers ККД-1500/180
Capacity – 1550 cu m/hr;
Compressive strength of rock bulk - up to 250 MPa;
Feed size - up to 1200 mm;
Discharge opening width – 180 mm.

Reducing crushing
Reducing crushing cone crushers КРД-700/75
Capacity – up to 400 cu.m/hr;
Compressive strength of rock bulk – up to 250 MPa;
Feed size – 550mm;
Discharge opening width – 75mm.

Reducing crushing cone crushers КРД-700/100
Capacity – up to 780 cu.m/hr;
Compressive strength of rock bulk – up to 250 MPa;
Feed size – 550mm;
Discharge opening width – 100mm.
Secondary crushing
КСД-2200Гр
Capacity - 360-610 cu.m/hr;
Compressive strength of rock bulk - up to 300 MPa;
Max. feed size – 300 mm;
Range of discharge opening adjustment – 30...60 mm.
КСД-2200Т
Capacity – 180-360 cu.m/hr;
Compressive strength of rock bulk - up to 300 MPa;

Max.feed size – 250 mm;
Range of discharge opening adjustment – 15...30 mm.

Fine crushing:

КМД-2200Т1

Capacity – 170-230 cu.m/hr;
Compressive strength of rock bulk - up to 300 MPa;
Max.feed size – 85 mm;
Range of discharge opening adjustment - 5-15 mm.

КМД-2200Т2

Capacity - 150 cu.m/hr*;
Compressive strength of rock bulk - up to 300 MPa;
Max.feed size up to 80 mm;
Range of discharge opening adjustment - 8-12 mm.

* - by strength of rock bulk of 100-150 Mpa and humidity of up to 4% in open cycle.

1.39 Jaw crushers

ДЩ-4x6

Capacity – 10.....25 cu.m/hr;
Compressive strength of rock bulk - 300 MPa;
Feed size-up to 340 mm;
Discharge opening width – 40.....90 mm.

ДЩ-4x9

Capacity – 15....35 cu.m/hr;
Compressive strength of rock bulk - 300 MPa;
Feed size-up to 340 mm;
Discharge opening width – 40.....90 mm.

ДЩ-6x9

Capacity – 35....80 cu.m/hr;
Compressive strength of rock bulk - 300 MPa;
Feed size-up to 500 mm;
Discharge opening width – 70.....130 mm.

ДЩ-2.5x9

Capacity – 10....25 cu.m/hr;
Compressive strength of rock bulk - 300 MPa;
Feed size-up to 210 mm;
Discharge opening width – 20...60 mm.

1.40 Jaw crushers for hot agglomerate

ДЩГ – 7,5x27

Capacity – 210...280 cu.m/hr;
Feed size – 300x1000x2500 mm;
Discharge opening width – 160 mm.

1.41 Smooth roll crushers

ДГ-1000x60

Capacity – 65 cu.m/hr;
Compressive strength of rock bulk - 110 MPa;
Feed size – 50mm;
Size of the crushed lumps – 0...40mm; 0...20mm.

1.41 Toothed screw crushers

ДШЗ-500/140

Capacity up to 200 cu.m/hr*;
Compressive strength of rock bulk - up to 120 MPa;
Feed size-up to 600 mm;
Discharge opening width – 140 mm.

ДШЗ-750/250

Capacity-up to 450 cu.m/hr*;
Compressive strength of rock bulk-up to 120 Mpa;
Feed size-up to 900 mm;

Discharge opening width-250mm.
 ДШЗ-1000/320-Б
 Capacity - up to 400 cu.m/hr*;
 Compressive strength of rock bulk - up to 150 MPa;
 Feed size-up to 1200 mm;
 Discharge opening width – 320 mm.
 ДШЗ-1000/320-У
 Capacity - up to 800 cu.m/hr*;
 Compressive strength of rock bulk - up to 150 MPa;
 Feed size-up to 1200 mm;
 Discharge opening width – 320 mm.
 ДШЗ-1300/300-ДР
 Capacity - up to 2000 cu.m/hr*;
 Compressive strength of rock bulk - up to 150 MPa;
 Feed size-up to 1300 mm;
 Discharge opening width – 300 mm.

* - by strength of rock bulk of 80-100 Mpa, 25% content of lumps with maximal dimension in raw product;
 - crushers capacity of ДШЗ type can be changed by increasing/reducing length of the feed opening and power of the drive motors

1.43 Smooth roll crushers, toothed roll, rotary and hammer crushers

Toothed-double-roll crushers ДДЗ 1500x1200 Г
 Capacity - 150...450 t/hr;
 Feed size - 500 mm;
 Width of discharge opening - 25...150 mm;
 Compressive strength of rock bulk up to 150 MPa.

Smooth four-roll crushers Д4Г900x700
 Capacity – 65 cu.m/hr;
 Material being crushed - coke
 Feed size-up to 40 mm;
 Finished product size – 2.....10 mm.

Rotary crushers ДР-1200
 Capacity – 1200 t/hr;
 Material being crushed - coal
 Feed size – 1200 mm;
 Outgoing fraction control range - 50...100 mm.

Hammer crushers ДМР-14,5x13
 Capacity - up to 300 t/hr;
 Feed size – 80 mm;
 Material being crushed – coal, limestone
 Finished product size - 0...3 mm;
 Compressive strength of rock bulk – up to 100 MPa.

Mills

1.44 Wet grinding mills.
 Center-discharge rod mills for wet grinding of ore and nonmetallic mineral resources (except for plastics): МСЦ 3200x4500*, МСЦ 3600x4500, МСЦ 3600x5500, МСЦ 3850x5500, МСЦ 4000x5500;
 Center-discharge ball mills for wet grinding of ore and nonmetallic mineral resources (except for plastics) – МШЦ 3200x4500, МШЦ 3600x4000, МШЦ 3600x5500, МШЦ 4000x5500, МШЦ 4430x5500, МШЦ 4500x6000, МШЦ 4500x7500.
 Center discharge ball mills for ore wet grinding МШЦ 5500x6500, МШЦ 5500x7500, МШЦ 5500x8500.
 Ball mills with grate for wet grinding of ore and nonmetallic mineral resources (except for plastics)- МШР 3200x4500, МШР 3600x4000, МШР 3600x5000, МШР 3850x4000, МШР 4000x5000, МШР 4500x5000.
 Ore-pebble mills for ore wet grinding – МРП 4000x7500, МШРП 4500x6000, МРГ 5500x7500М.

* In all designations of mill types the first group of figures following the letters indicates the drum diameter, the other one – its length in mm.

- Self-grinding and semi-self-grinding mills for ore wet grinding MMC 70x23, ММПС 70x23, MMC 90x30, ММПС 9350x3100, ММПС 70x70, ММПС 70x42, ММПС 70x52.
- 1.45 Dry grinding mills
Ball mills for dry grinding МШР 1.5x5.6.
Output – 10 t/hr.
Cement grinding mills МЦ-3.2x9, МЦ-3.2x12, МЦ-4.0x13.
Output – 27; 30; 35 t/hr respectively.
Drum-roll mills with output up to 100 t/hr, with reduced specific consumption of electric power, exclusion of small particles, downsizing.
- 1.46 Coal grinding mills:
МБ 56/29 (with drum length to diameter ratio 0,5)
Output – 75 t/hr.
Ш-60
Output - 60 t/hr. (Mounting on existing foundations of mills Ш -50 and Ш -50A is possible).
Ш-50
Output – 50 t/hr.
Ш-50А
Output – 50 t/hr.
ШБМ 320/570 (Ш-25)
Output – 25 t/hr.
ШБМ 287/470 (Ш-16)
Output – 16 t/hr.
- 1.47 Maintenance sets of drives for grinding mills Ш-50 and Ш-50А, including ring gear, driving pinion assembly, ring gear guard with drive mounting on existing foundations of Ш-50 and Ш-50А mills.
- 1.48 Mechanization facilities for maintenance operations for grinding mills:
– devices for mill drum slow rotation;
– devices for mill drum hoisting, consisting of four hydraulic jacks, pumping plant and two lifting beams;
– units for mill drum relining (with discharge of grinding bodies).
Hydraulic jacks for grinding mill mounting and maintenance operations; load capacity – 200 and 300 t.
Various-purpose service equipment
- 1.49 Slurry pumps
АН 22x26 ПМ
Capacity - 9000 cu.m/hr;
Head – 90 m;
Motor power - 4000 kW;
АНПМ-9000
Capacity - 9000 cu.m/hr;
Head – 105 m;
Motor power - 4000 kW.
- 1.50 Car dumpers for unloading open wagons with the capacity of 60...93 t (track gauge – 1524 mm):
– Stationary side;
– Movable side;
– Stationary rotary;
– Movable rotary.
- 1.50.1 Modernization of electrical part of the supplied machines with application of modern electrical equipment, drives and power-saving control systems.
- 1.51 Automated Process Control System and electric drive of mining complexes.
- 1.52 Automated Process Control System and hydraulic pneumatic drive of mining complexes.
- 1.53 Mining equipment one-shot lubricating system.

2. COAL INDUSTRY MACHINE-BUILDING

Drum winders with electrical equipment and automated process control system

- 2.1 Drum winders, type 2Ц and ЦР, single drum and БЦК, drum dia – 4 m and more, with outside brake position.
- 2.2 Drum winders, type МПБ, drum dia – 5 m and more, with inside brake position.
- 2.3 Multirope mine winders, rope sheave dia 3,25 m and more, type МПМН, МК and ЦШ.
- 2.3.1 Mine winding plants automated process control system.

- 2.3.2 Shaft signal system and connection.
- 2.4 Skips, ballasts, headframe pulleys, charging and discharging units, guides, box distance bars and girders for bore reinforcement.
- 2.4.1 Spare parts for all mine winders. Modernization of the existing machines with their re-equipment to multirope ground-based machines.

Heading, mining and conveying machines

- 2.5 Heading machine П-110 with two cutter heads located radially.
- 2.6 Heading machine П-110-01 (П 220) with two cutter heads located radially.
- 2.7 Heading machine П-110-04 with axial cutter head.
- 2.8 Heading machine П-110-01 (П 220) equipped with a drilling rig for anchor installation.
- 2.9 Heading machine П-110-01М with two cutter heads located radially, certified in conformity with the European standard ATEX.
- 2.10 Loading belt, belt width 800 mm for heading machines П-110, П-110-01.
- 2.11 Mining machine УКДЗ with remote feed system for beds of 0,8-1,3 m.
- 2.12 Mining machine УКД 200 with remote feed system for beds of 0,8-1,3 m.
- 2.13 Mining machine УКН 400 with built-in feed system and frequency adjustment of feed drive for beds of 0,8-1,5 m.
- 2.14 Machines МП-2 for loading rock bulk crushed by means of drilling-and-blasting method.
- 2.15 Machines МБП-2 for drilling pits for charge seating and subsequent loading of rock bulk crushed by means of drilling-and-blasting method.
- 2.16 Flight conveyors КСД 28.
- 2.17 Dintheaders МПП with cutting tool.
- 2.18 Bucket – rippers МППк.

3. METALLURGICAL EQUIPMENT

Complete deliveries including engineering, supervision of erection and adjustment, training

- 3.1 Electric arc steel - making furnaces
- 3.2 After-furnace ladle steel treatment units: «Ladle-furnace».
- 3.3 Vacuum degassing facilities “VD-VOD”.
- 3.4 Slab continuous casting machines.
- 3.5 Billet continuous casting machines.
- 3.6 Equipment for scrap recycling.

Basic manufacturing equipment

- 3.7 Transport-and-finishing slab handling line.
- 3.7 Materials preparation area equipment.
- 3.8 Ladle gates.
- 3.9 Wire feeders.
- 3.10 Ladle flood lining facilities.
- 3.11 Pulverized material injection facilities.
- 3.12 CCM rollers.
- 3.13 CCM roller segments.
- 3.14 CCM casting bow equipment.
- 3.15 Ladle vertical drying stands.
- 3.16 Ladle horizontal heating stands.
- 3.17 Tundish drying and heating stands.
- 3.18 CCM lifting - and - turning stands.
- 3.19 Withdrawal straightening units.
- 3.20 Chain, rigid, semi-rigid and combined dummy-bars.
- 3.21 Mould oscillators.
- 3.22 Hydraulic flying shears.
- 3.23 Vacuum steam ejector pumps.
- 3.24 Self-propelled and non-self-propelled cars.
- 3.25 Electric furnaces for nonferrous alloys melting.
- 3.26 Furnaces for ferroalloys calcination.
- 3.27 Floor charging machines.
- 3.28 Units for hard-surfacing the blast furnace bells and hoppers.

- 3.29 Welding and surfacing units.
- 3.30 Centrifugal casting machines.

Dressing equipment

- 3.31 Mixers and pelletizers.
- 3.32 Roasting cars.
Sintering area – 4,0; 5,25; 6,6 m2.
Depth – 485, 423, 400 mm.
- 3.33 Briquetting units.
- 3.34 Single-roll crushers: ДО-1,3x2,7; ДО-1,3x4,2.
- 3.35 Inertial screens ГИЛ-32, mobile.
- 3.36 8-, 10-, 14-roll, single and twin revolving disk grizzlies.
- 3.37 Furnace - charge distributors.
- 3.38 Sintering cars.
- 3.39 Apron conveyors.
- 3.40 Gas cleaning systems equipment.
- 3.41 Kilns.

Blast furnace equipment

- 3.42 Blast-furnace jacket.
- 3.43 Cooling plates.
- 3.44 Machines for plugging up the tap-holes in blast furnaces.
- 3.45 Top bells control winches ЛК-38М and ЛК-45.
- 3.46 Skip winches ЛС -15; ЛС -22,5; ЛС -29; ЛС -39.
- 3.47 Skips.
- 3.48 Rope sheaves.
- 3.49 Valves: of cold blast, chimney, atmospheric steam dump, air-relief, compensation, relief, gas throttle, air and gas throttle, shut-off, plug etc.
- 3.50 Water filters Dnom 400; 500; 600; 700.
- 3.51 Self-propelled and non self-propelled slag cars.
- 3.52 Self-propelled and non self-propelled hot-metal ladle cars.
- 3.53 Conveyor-type iron casting machines.
- 3.54 Trough charging device.
- 3.55 Taper - type charging device.
- 3.56 Slag dehydrator of rotary type.

Steelmaking and ferroalloy equipment

- 3.57 Oxygen-blown converters with the capacity from 50 to 350 t.
- 3.58 Converters bodies.
- 3.59 Converter swiveling mechanisms.
- 3.60 Equipment for electroslag remelting furnaces.
- 3.61 150, 200, 250, 300, 350, 420 and 600 t mobile mixers.
- 3.62 300, 450, 600, 800, 1300, and 2500 t stationary mixers.
- 3.63 Stands for mobile mixers repair.
- 3.65 Machines for slag skimming from hot-metal transfer ladles with ladle tilting turrets.
- 3.66 Ingot-mould cars.
- 3.67 Self-propelled scrap cars.
- 3.68 Self-propelled teeming ladle cars.
- 3.69 Hot-metal ladles.
- 3.70 Steel-teeming ladles.
- 3.71 Stands for assembly and welding of consumable electrodes.
- 3.72 Gate hoist winches.
- 3.73 Ferroalloy casting machines of conveyor type.
- 3.74 Rotary furnaces for aluminium secondary processing.
- 3.75 Pelletizers.
- 3.76 Metallurgical equipment automated process control systems and electric drive.
- 3.77 Metallurgical equipment automated process control systems and hydro pneumatic drive.
- 3.78 Metallurgical equipment centralized lubricating system.

4. ROLLING-MILL MACHINERY

Complete deliveries, including engineering, supervision of erection and adjustment, training

- 4.1 Plate mills, work roll barrel length up to 5000 mm.
- 4.2 Wide-strip ferrous hot rolling mills.
- 4.3 Wide-strip mills for hot rolling of aluminium and other non-ferrous alloys.
- 4.4 Special-purpose wide-strip mills with furnace coilers (Steckel type).
- 4.5 Wide-strip single and multistand cold rolling mills for ferrous metals, aluminium and its alloys.
- 4.6 Reversing hot and cold mini-mills for sheet-by-sheet rolling.
- 4.7 Primary, billet and section rolling mills.
- 4.8 Small-section and wire mills.
- 4.9 Continuous casting direct rolling facilities consisting of continuous-casting machine, preheating furnace and wide strip mill.
- 4.10 Slitting units.
- 4.11 Cross-cutting units.
- 4.12 Straightening units.
- 4.13 Combined cutting and straightening units.

Basic manufacturing equipment

- 4.14 Devices for charging and discharging slabs from heating furnaces.
- 4.15 Furnace, main, intermediate and delivery tables.
- 4.16 Vertical stands for wide-strip hot rolling mills (including edgers).
- 4.17 Two- and four-high stands for wide strip hot rolling mills.
- 4.18 Two- high stands for section and small-section mills.
- 4.19 Two- and four-high stands for plate mills.
- 4.20 Side guards, centering guards and guards.
- 4.21 Scanning guards with hydraulic tracking drive.
- 4.22 Interstand equipment for finishing stands (guards, guides and loopers).
- 4.23 Roller quenching machines.
- 4.24 Strip accelerated cooling units.
- 4.25 Plate slitting and cross cutting shears including shears with rolling cut.
- 4.26 Double-cut plate trimming shears with rolling cut.
- 4.27 Circular plate trimming shears.
- 4.28 Continuous cast billet and bar shears.
- 4.29 Bar shears.
- 4.30 Flying shears.
- 4.31 Hot and cold strip coilers.
- 4.32 Trimmings coilers.
- 4.33 Furnace coilers.
- 4.34 Carryover pinch rolls.
- 4.35 Mechanisms for coil transfer from coiler to conveyor.
- 4.36 Conveyors, step transporters for coils, pallet roller tables.
- 4.37 Wire bundle conveyors.
- 4.38 Car-strippers.
- 4.39 Coil tilters.
- 4.40 Coil receivers.
- 4.41 Lifting-turning tables.
- 4.42 Plate pilers.
- 4.43 Plate turnovers.
- 4.44 Heat shields.
- 4.45 Hot and cold sheet-straightening machines.
- 4.46 Working stand rolls and table rollers drives.
- 4.47 Mill multi-input and combined speed reducers.
- 4.48 Roller tables distributing speed reducers.
- 4.49 Gear clutches.
- 4.50 Roller sleeves.
- 4.51 Spindle arrangements with toothed hinges.
- 4.52 Spindle arrangements with universal hinges on sliding inserts.
- 4.53 Roller spindles.

Ancillary equipment

- 4.54 Mechanized devices for work and backup rolls changing.
- 4.55 Stands for assembly and disassembly of rolls with chocks units.
- 4.56 Tilters of chocks with bearing units.
- 4.57 Bearing units dismounting devices.
- 4.58 Universal machines for reconditioning the working surfaces of slabbing mills, wide-strip hot and cold and other rolling mills housings.
- 4.59 Hydraulic cylinders of different standard sizes.
- 4.60 Spare parts and equipment for maintenance of all types of rolling-mill machinery.

Electric and hydropneumatic lubrication processing systems.

- 4.61 Electric drive and control systems.
- 4.62 Automated process control systems.
- 4.63 Hydraulic systems.
- 4.64 Furnace and mill hydraulic descaling system.
- 4.65 Work roll cooling and heat contouring systems with sectional and individual control of nozzles.
- 4.66 Interstand strip cooling systems.
- 4.67 Strip cooling systems on runout tables.
- 4.68 Hot strip mill rolls lubrication systems.
- 4.69 Slab and billet CCMs primary and secondary cooling systems.
- 4.70 Breakdown bar controlled cooling systems for plate mill.
- 4.71 Aluminum-cold strip mill rolls lubrication systems.
- 4.72 Cooling and heat contouring systems for aluminum strip cold rolling mills.
- 4.73 Automatic oil and grease lubrication systems for machinery.
- 4.74 "Oil-air" automatic lubrication systems.
- 4.75 Lubrication stations with the capacity of 50-2500 l/min.
- 4.76 Separate arrangements and units of lubrication systems of machinery (tanks, accumulators, water separators, lubrication headers, etc).
- 4.77 Mechanisms functional control units.
- 4.78 Pumping plants and pump-and-accumulator stations for various purposes.
- 4.79 Separate devices and units of the hydraulic control systems (tanks, accumulators, control panels, pump units, pipes connections etc).
- 4.80 Various-purpose pneumatic systems with adjustable flow rate and pressure.

5. MILL ROLLS

- 5.1 Solid-forged cold work rolls.
- 5.2 Solid-forged cold backup rolls.
- 5.3 Solid-forged hot work rolls.
- 5.4 Solid-forged hot backup rolls.
- 5.5 Composite work rolls for finishing stands of hot rolling mills with high-chromium iron and high-speed steel working layer.
- 5.6 Composite work rolls for roughing stands of hot rolling mills with high-chromium steel working layer.
- 5.7 Composite backup rolls for hot and cold rolling with carbon high-alloy steel working layer.
- 5.8 Plate mill sleeved backup rolls.
- 5.9 Draw bar and mandrels for tube production.

6. POWER-GENERATING EQUIPMENT AND TRANSMISSION COMPONENTS

- 6.1 Rotor shafts for wind power plant of 1,5 mW, wind power plant of 2,0 mW, wind power plant of 2,5 mW, wind power plant of 3,0 mW.
- 6.2 Generator shafts.
- 6.3 Electric motors shafts.
- 6.4 Discs and rotors for steam and gas turbines.
- 6.5 Hydraulic turbine shafts.
- 6.6 Turbines.
- 6.7 Propeller shafts, cutlass bearings, ship steering parts.
- 6.8 Shafts and shells for cement industry equipment.
- 6.9 Shafts for pulp-and-paper industry.

7. PRESS - FORGING MACHINERY

Hydraulic presses:

- 7.1 Hydraulic stamping presses, capacity up to 750 MN.
- 7.2 Hydraulic forging presses, capacity up to 200 MN.
- 7.3 Vertical extrusion and stamping hydraulic presses, capacity up to 450 MN.
- 7.3.1 Hot briquetting roll press.
- 7.4 Hydraulic presses for powder materials (ferroalloys) pressing, capacity of 400 kN.
- 7.5 Modernization and substitution of obsolete press (hydraulic, steam-hydraulic) control systems to modern electrohydraulic ones.

Crank presses:

- 7.6 Hot stamping crank presses with capacity from 16000 kN.
- 7.7 Sheet-stamping crank presses with capacity 1600-10000 kN.
- 7.8 Horizontal forging machines with vertical split of dies, capacity up to 31500 kN.

Plate/sheet bending and straightening machines; lines on their basis:

- 7.9 Three-and four-roll sheet bending machines having working area up to 12000mm long.
- 7.10 Roll straighteners for hot and cold plates of standard and high strength up to 4500 mm wide and up to 100 mm thick.
- 7.11 Lines for producing skelps for single-seam oil-and-gas pipes with 530...1420mm diameter.

Hammers:

- 7.12 Die-forging anvil hammers, blow energy from 125 up to 800 kJ.
- 7.13 Die-forging no-anvil hammers, blow energy from 400 to 1600 kJ.
- 7.14 Air - steam forging hammers of bridge type, 80-240 kJ.
- 7.15 Air - steam arch-type forging hammers, 50-80 kJ.

Heating and heat-treatment furnaces:

- 7.16 Two-chamber heating furnaces.
- 7.17 Car - bottom heat-treatment and heating furnaces.
- 7.18 Roller-hearth heating furnaces.
- 7.19 Bell-type furnaces.
- 7.20 Low-temperature tempering furnace (up to 300 C).
- 7.21 Vertical (shaft) heat-treating furnaces.
- 7.22 Pulse heating and cooling units.
- 7.23 Throttle-regulating devices.
- 7.24 Fire check valves.
- 7.25 Press-forging equipment automated process control system and electric drive.
- 7.26 Press-forging equipment automated process control system and hydro pneumatic drive.
- 7.27 Press-forging equipment centralized lubricating system.

8. HOISTING-AND-CONVEYING MACHINERY

- 8.1 Stripping cranes.
- 8.2 Pouring cranes with lifting capacity up to 650 t.
- 8.3 Pratzten-cranes (cranes with grabs).
- 8.4 Electric overhead pit cranes.
- 8.5 Electric overhead grab cranes.
- 8.6 General-purpose electric overhead cranes.
- 8.7 Electric overhead slab-transporting cranes.
- 8.8 Overhead cranes with hook swinging mechanism.
- 8.9 Electric overhead cranes with the cross beam flexible suspension and swinging trolley, capacity-up to 80 t.
- 8.10 Travelling gantry and semi-gantry, grab and general purpose cranes.
- 8.11 Special-purpose cranes for hydroelectric station.
- 8.12 Portal full-swing cranes, capacity 16/20/32 t, boom 8-32 m.
- 8.13 Ship loaders and unloaders.
- 8.14 Loading grab cranes.

- 8.15 Unloading and reloading machines for nuclear power station.
- 8.16 Lifting traverses for metallurgical equipment servicing.
- 8.17 Rope grabs of different capacity.
- 8.18 Winches for metallurgical equipment servicing.
- 8.19 Special-purpose dogging cranes.
- 8.20 Hydraulic crawler-mounted cranes, lifting capacity up to 25 t.
- 8.21 Telescope booms for cranes:
 - lifting capacity – 25 t, (4 sections, length – 27 m and hydraulic cylinder for telescoping);
 - lifting capacity – 40 t, (2 sections, length – 18 m and hydraulic cylinder for telescoping);
 - lifting capacity – 50 t, (4 sections, length – 35 m and hydraulic cylinder for telescoping).
- 8.22 Self-propelled jib cranes KKC-55 with lifting capacity of 55 t on short wheelbase undercarriage MoA3 8004.
- 8.23 Autohydraulic hoists for fire-fighting service, hoisting height-30 m.
- 8.24 Autohydraulic hoists МГП-28.04 on the base of KpA3-65101 undercarriage.
- 8.25 Autohydraulic hoists МГП-28.03 on the base of all-wheel drive undercarriage KpA3-260Г.
- 8.26 Cargo winches HK-312-0304-00-000, rope force 6.9 t.
- 8.27 Cargo winches HK-312-0305-00-000, rope force 3.6 t.
- 8.28 IMP-2M emergency-rescue vehicles.
- 8.29 General-purpose and special-purpose winches.
- 8.30 Rope hanging equipment.
- 8.31 Facilities (cranes) for slab transfer – УПС.
- 8.32 Loading-unloading facilities (cranes) for flat products transfer – ЗПУ.
- 8.33 Spares for crane facilities:
 - Crane wheels.
 - Hoist drums.
 - Mechanisms of hoist, crane and trolley travel.
 - Shoe brakes ТКП-400, ТКП-500, ТКП-600, ТКП-700, ТКП-800.
 - Cross beams and suspensions.

Balancing trolleys.

- Components of crane metal structures.
- Crane cabins.
- 8.34 Facilities (cranes) for slab transfer and tilting – УКТС.
- 8.34.1 Modernization of electrical part of the supplied cranes with application of modern electrical equipment, drives and power-saving control systems.
- 8.35 Hydraulic loader with pulling force up to 630 ton-force.

9. RAILWAY EQUIPMENT AND SPECIAL-PURPOSE MACHINERY

- 9.1 Made-to-order railway cranes.
- 9.2 Railway cranes with EDK undercarriage.
- 9.3 Car retarders HK-114 of КНП-5-73 type.
- 9.4 Body car retarders HK 140.
- 9.5 Control units for car retarders БУВЗ-400.
- 9.6 Screw-and rack type hoists for locomotive sheds.
- 9.7 Mobile modernized tower 40B6M (40B6MД) for air defense complex C-300.
- 9.8 Hooks with lifting capacity of 0.5...20 t.
- 9.9 Motor-driven and reclamped grabs with the capacity of 0.6...1.6 cu.m.
- 9.10 Hanging equipment for road-building and agricultural machinery.
- 9.11 Electrically operated rotating drums for leather dressing.
- 9.12 Cars, carrying capacity 1...25 t, for intershop transportation.
- 9.13 Intershop cars for indoor use also.
- 9.14 Selfdumping containers for bulk, chip and scrap materials.
- 9.15 Facilities for galvanic processing, including for:
 - Galvanizing.
 - Phosphatization.
 - Oxidation.
 - Copper plating.
 - Chromium plating.

- Nickel plating.
- Passivation.
- Pickling.
- Zink removal.
- Chromium removal.
- Nickel removal.
- Collecting.
- Washing.
- Electrolytic chemical polishing.
- Electrolytic chemical degreasing.
- Treatment in acetic acid.
- Alkalization.
- 9.16 Movable gate.
- 9.17 Units for assembly - beading of bottoms and bodies.
- 9.18 Machine tools for making and working the springs of bar of diameter of 8...60 mm, inside diameter - 50...300 mm including:
 - machine tools for hot spring coiling;
 - machine tools for grinding the spring faces;
 - facilities for prefacing the spring faces of bar having diameter of 30...60 mm by gas torch.
- 9.19 Devices for mechanization of building up the electrodes in electric melting furnaces.
- 9.20 Multiposition plants for semi-automatic milling the workpieces of wood at series and mass production.
- 9.21 Equipment and auxiliaries for repairing major manufacturing installations.
- 9.21.1 Portable metal working devices for machining the worn-out surfaces of large - sized parts of press and forging equipment at site of installation:
 - devices for boring holes with diameters 150-450 mm; 500-1500 mm.
 - portable machines for milling the worn - out surfaces of anvil blocks;
 - devices for milling flat circular surfaces such as mounting seats for press column nuts.
- 9.21.2 Jacks:
 - lifting capacity 100-400 t, lifting height - 150 mm,
 - small - sized jacks, lifting height - 60 mm, lifting capacity - 25 t, stroke - 20 mm.
- 9.22 Automatic lines of pneumatic transport for dry sand.
- 9.23 Automatic machines for manufacture of moulding hooks.
- 9.24 Cantilever slewing exhaust unit.
- 9.25 Machines for clearing and winding of welding wire.
- 9.26 Units for local heat treatment of welds.
- 9.27 Stands for measuring of vibrocharacteristics of pneumatic chipping hammers.
- 9.28 Stands for measuring of vibrocharacteristics of pneumatic drilling machines.
- 9.29 Stands for measuring of vibrocharacteristics of pneumatic grinding machines.
- 9.30 Trailer-type cable-laying machines (for 600 m) for rail-mounted cars with electric drive.
- 9.31 Intershop transport tanks of 0.5, 1, 2 cu.m capacity (due to bodies of motor car transport and battery-operated trucks).
- 9.32 Chambers for parts shot blast cleaning.
- 9.33 Powder fire-fighting set.
- 9.34 Rotating tables of load-carrying capacity specified.
- 9.35 Machines for surface induction hardening.
- 9.36 Electric oil baths for parts tempering after hardening.
- 9.37 Hardening (water and oil) mechanized tanks.
- 9.38 Argon and carbonic acid manifolds.
- 9.39 Vibrating conveyors.
- 9.40 Units for emulsion preparation.
- 9.41 4-roll chip-crushers (Q=2...4 t/hr., fraction 40...120 mm).
- 9.42 Stands for levelling of motor cars bodies.
- 9.43 Unit for washing of motor cars.
- 9.44 Roll press-grinders.
- 9.45 Railway transport facilities for intraworks carriage of heavy, large - sized and long-sized parts.
- 9.46 Furnaces for chemical heat treatment.
- 9.47 Stands, chambers for washing, painting and drying of machine units.
- 9.48 Universal stands for inspection of cars clutch plates.
- 9.49 Air pumps for aggressive mediums,
Capacity - 400 l/hr, head - 10 m.

- 9.50 Drum driers for sand.
- 9.51 Portable units for air laying of antisticking paint on the mold surface.
- 9.52 Units for distilled water production.
Capacity – 35 l/hr.
- 9.53 Telescopic platforms for work at a height.
- 9.54 Equipment for wind power units.
- 9.55 Vacuum degassing steam-ejector pump unit ПЭВН.00.00.00.000.
- 9.56 Thermos-car, capacity of 60t.
- 9.57 Sling making machine.
- 9.58 Equipment for liquid glass melting.
- 9.59 Unit for tank hydraulic tests.
- 9.60 Gas cylinder system vacuum degassing and pressure test stand.
- 9.61 Equipment for bearings preservation.
- 9.62 Metal samples pneumatic transport.
- 9.63 Cultivators HK-304 of КПС-4 type and spares to them.

10. REDUCTION GEARS AND GEAR TRANSMISSIONS

- 10.1 General-purpose cylindrical gear speed reducers:
Single-reduction, center distance – 355...1250 mm.
Double - reduction, center distance of low speed stage -400...1250 mm.
Triple-reduction, center distance of low speed stage 400...1250 mm.
- 10.2 Large-sized cylindrical single - and double-reduction (mill), center distance - up to 2700 mm.
- 10.3 Pinion stands, center distance – 500...1400 mm.
- 10.4 Worm reducers, cylindrical and globoid, single-reduction with the worm under, over and at the side of the wheel, center distance - 63...630 mm.
- 10.5 Worm reducers, cylindrical and globoid, double-reduction, center distance of low speed stage - 160...400 mm.
- 10.6 Combined gear speed reducers, worm-cylindrical and cylindrical-worm.
- 10.7 Planetary gear speed reducers, single-, double- and triple-reduction, with vertical and horizontal version of output shaft. The output shaft torque up to 1000 kNm
- 10.8 Mine winder reduction gears.
Double-drive ЦО-14, ЦО-16, ЦО-18, ЦО-22, 2ЦД-2200, center distance 1400 mm;1600 mm; 1800 mm; 2200 mm.
Double-reduction speed reducer ЦД-20, overall center distance – 2000 mm; reduction ratio-20.
- 10.9 Cylindrical-bevel-cylindrical speed reducers.
With centre distance of low speed stage up to 1250 mm, transmission capacity up to 1000 kW.
With integrated stop in the form of a backward running clutch.
- 10.10 Gear wheels and pinion shafts: cylindrical, bevel, worm etc.
- 10.11 Gear couplings for connecting the shafts with dia of 30 – 1000 mm
- 10.12 Reducers for mechanisms drives of bucket-wheel, walking and crawler-mounted excavators, trunk conveyors, underground escalators.
- 10.13 Design and manufacture of reducers for import equipment.

11. FACILITIES FOR HYDRAULIC STRUCTURES

- 11.1 Cone gates of dam water outlet up to 2500 mm in dia, mechanically or hydraulically driven.
- 11.2 Hydraulic loaders, pulling force up to 630 tf.
- 11.3 Hydraulic drives for radial gates, force up to 320 tf, rod stroke up to 15 m.
- 11.4 Hydraulic drives for plain gates, force up to 1600 tf, rod stroke up to 15 m.
- 11.5 Step hydraulic drives for plain gates, force up to 1600 tf, lifting height up to 56 m.
- 11.6 Radial gate supports.

12. METALLURGICAL PROCESSES AND HEAT TREATMENT, MANUFACTURE OF CASTINGS

- 12.1 Fettling, cleaning and primary heat treatment of steel and iron castings weighing from 0.5 to 110 t.
- 12.2 Induction hardening of teeth, bushings, casings, wheels, pinion-shafts, pistons, screws, rolls, chocks, disks and other parts.
- 12.3 Chemical heat treatment of heavy-duty gear teeth.
- 12.4 Annealing, isothermal annealing, normalizing cum tempering and tempering of blanks.
- 12.5 Hardening with subsequent tempering of forged oversized blanks weighing up to 65 t with the following dimensions:
cylindrical: up to 2500 mm in dia, up to 25000 mm long;
rectangular: up to 200 mm thick at up to 2500 mm wide;
from 200 to 700 mm thick at width up to 2000 mm;
from 700 mm thick and more at width up to 1500 mm;
rings, sleeves weighing up to 25 t, up to 4500mm in dia.
- 12.6 Hardening cum tempering of cast parts.
- 12.7 Tempering of metal structures, iron castings, ageing of forgings and castings in the process of machining.
- 12.8 Gas carburizing of machined parts up to 3500 mm long and up to 1850 mm in diameter.
- 12.9 High-temperature hardening of parts up to 2500 mm in dia, weighing up to 25 t of steels ЭИ-415, 2X13, 3X13, ЭИ-961, ЭИ-802 and other heat-resistant grades of steel.
- 12.10 Carrying out of research and development works on metallurgical processes problems.
- 12.11 The test center is equipped with modern facilities allowing to carry out the check of forgings, castings, welded joints etc. The center experts have the certificates of competence and have undergone training in specialized centers.
The test center is accredited for technical competence for testing high risk facilities under control of State Committee for Supervision.
- 12.12 Steel castings:
manufacture of box-type parts (cross bars, bodies, housings) weighing up to 105 t of carbon, low-alloy and medium-alloy steels;
manufacture of heavy parts (anvil blocks, impact plates, rams) weighing 80...110t of carbon, low-alloy and medium-alloy steels;
manufacture of castings weighing 5...10 t of carbon and alloy steels as well as high alloy steels with special properties (toothed wheels, bodies, speed reducer covers);
manufacture of light castings of carbon and alloy steels weighing 0.05...1 t (armour plates, lugs, covers);
manufacture of any type of low carbon medium alloy and high alloy steel castings weighing from 1 to 105 t, bell-tape – up to 60 t.
- 12.13. Iron castings. Castings of the following iron grades can be manufactured:
gray cast iron C415, C420, C425, C430 GOST 1412-85 for castings weighing up to 70 t;
irons for ingot molds, bottom plates, hot tops C4И1, C4И2, TU 24.00.13.031-87, ingot molds weighing up to 105 t;
special-properties irons 4X1, 4X3, 4C5Ш GOST 7769-82, 4X28Г2H1MФ, as per special TU;
antifriction iron A4C1 GOST 1585-85;
high-strength irons as per DSTU 3925-99; B4450-5, B4500-2 for castings weighing up to 4, 5 t;
B4600-3, B4700-2 for castings weighing up to 50 kg;
special-purpose irons C4P (for retorts), C420XH (for blast-furnaces lining), Gh 190 (for car spares);
In separate cases castings of other iron grades can be considered and accepted for manufacture.
- 12.14 Non-ferrous castings:
Castings of the following bronze and aluminium alloy grades can be manufactured:
БрА9Ж3Л, БрА10Ж3Мц2Л, БрА10Ж4Н4Л GOST 493-79;
БрО10Ф1, БрО5Ц5С5 GOST 613-79;
Manufacture of castings of other non-ferrous alloy grades is also possible.
For example: GZ CuSn12Ni, GZ Cu7ZnPb, GZ CuSn12Pb DIN 1705, БрО8С12 OST 24.916.01-82 etc.
manufacture of body-of-rotation type castings by centrifugal method with liquid metal weight from 20 kg to 3,5 t, diameter 105...1500 mm;
manufacture of heavy sleeve-, nut-, insert- type castings with the total weight of casting and accessories up to 10 t (crane capacity);

casting in stationary moulds with the diameter from 50 up to 150 mm and 300 mm high (with no regard for the head part);
making of castings of strap type with maximum dimensions 1000x500x50;
all castings of rotation-body-type are rough machined (agreed upon when signing the contract);
remelting of aluminium and copper scrap and casting into pigs.

13. PRESS-FORGING AND HEAT TREATMENT FACILITIES, MANUFACTURE OF FORGINGS

- 13.1 Forgings from ingots with premachining:
manufacture of parts of carbon and alloy steels of round, square, rectangular and combined sections as:
shafts weighing from 0.5 to 105 t, from 1.5 to 26 m long;
cylinders weighing from 0.2 to 105 t, from 250 to 2000 mm in diameter, from 600 to 9000 mm long.
rings, sleeves weighing from 0.2 to 65 t, from 0.5 to 4,8 m in diameter;
plates weighing from 0.5 to 110 t, up to 3, 5 m wide;
blocks weighing from 0.4 to 40 t, from 250x250x250 mm to 1800x1600x1500 mm;
manufacture of crank-shaft forgings with cranks positioned in two interperpendicular planes.
Forgings weight: 3-105 t, overall dimensions of cranks: 300-1600 mm.
manufacture of forgings of hollow spheres type truncated on both sides in the press with 10000 tf capacity . Forgings weight: 10-25 t, sphere dimensions: R=800-1200 mm, H=1000-1600 mm.
- 13.2 Forgings weighing from 5 to 400 kg of steel grades 20, 35, 45, 40XH, 40X, 38X2H2MA, 20X2H4A.
Manufacture of forgings of carbon and alloy steels of round, square, rectangular and combined sections by different methods:
by open forging of disks, blocks, bushings, rings, shafts, hubs, hexagon-head bolts with the thread size of M64-M100, hexagon nuts with the thread size of M42-M180, eye-bolts with the thread sizes of M72-M100;
by coiling method manufacture of torsion, tension, compression helical springs made of metal rolled products of steel 60C2(A) 0.8-50 mm.
- 13.3 Stampings weighing from 0.011 to 33 kg of carbon steels: eye-bolts M8-M64, hexagon-head bolts with the thread size M16-M56, single hooks with load capacity of 2-8 tons, fastening hooks with load capacity of 0.5...5 ton, angle pieces 1/4''
-2'', T-joints 1/4''-2'', knives for harvester-shredders, disk springs.
- 13.4 Open-hearth and electric arc melting pressing and forging ingots from carbon and alloy steels weighing 1.6 and 170 t, from low carbon and stainless steels weighing up to 51, 6 t;
Vacuum degassed bottom-poured ingots weighing 3-69,4 t of killed steel grades.
Tetrahedral bottom-poured ingots weighing 5-13.3 t for rolling mills.

14. METAL WORKS FABRICATION

- 14.1 Manufacture of machine-building, building and other metal structures of various purpose, including: of high-strength steels for operation under any climatic conditions (up to -50°C incl.)
- 14.2 Fabrication of welded cylindrical structures up to 6 m in diameter by electric arc welding.
- 14.3 Manufacture of cast-and-welded and forged-and-welded cylindrical parts of carbon and alloy steels by electric arc welding with an open narrow single-U butt weld having a throat from 500 to 4300 mm, up to 17000 mm long and with thickness of welded joint of up to 500 mm.
- 14.4 Argon arc welding of titanium with a thickness up to 15 mm. Welding of electroplating baths.
- 14.5 Electroslag welding of large-size articles weighting up-to - 300t of carbon and low-alloy steels with welded section of 4500x5500 mm and large-size cylindrical articles with diameter up to 3200mm.
- 14.6 Cutting-off of casting heads up to 1.5 m in diameter.
- 14.7 Surfacing of copper and alloys on copper basis on steel, cladding of copper with steel.
- 14.8 Welding of steels with copper and its alloys.
- 14.9 Manufacture of welded shells, milling of rolled plates with width 3600 mm at thickness 80 mm and more up to thickness 180mm at decrease of plate width respectively. 14.10 Manufacture of high-accuracy odd-shaped parts from low-alloy and intermediate-alloy steel plates with thickness from 6 to 300 mm and overall dimensions up to 2500x9000 mm in machines with CNC.
- 14.11 Manufacture of high-accuracy odd-shaped parts from corrosion-resistant steel, nonferrous metal

plates with thickness from 5 to 40 mm and overall dimensions up to 2500x9000 mm by plasma arc cutting in machines with CNC.

- 14.12 Wear resistant, anticorrosive, reinforcing and restoring hardfacing of cylindrical surfaces of plungers, rollers, shafts, rods and other parts with diameters from 40 to 2000 mm and weight up to 100t.
- 14.13 Manufacture of building structures for sheltered threshing-floors, granaries, etc.
- 14.14 Manufacture of crane bridges of any capacity and purpose.
- 14.15 Manufacture of welded rotors for radial blow machines (RBM).

15. MACHINING AND ASSEMBLY

- 15.1 Turret and turning operations:
manufacture of parts like screws, nuts, washers, bushings, wheels, axles, rollers, etc. with diameters up to 4000 mm, up to 25000 mm long and weighing up to 300 t.
- 15.2 Vertical turning and boring operations:
machining of parts with diameters from 500 mm to 13000 mm and height up to 5000 mm weighing up to 220 t.
- 15.3 Grinding operations:
cylindrical grinding of parts with min. grinding diameter of 5 mm, max. diameter 2300 mm, max. grinding length being 18000 mm, minimum radial run-out 0.002 mm (μm) on diameter of 600 mm, roughness Ra 0.1 μm .
internal grinding of holes with diameters from 40 to 300 mm, depth up to 1200 mm, and with accuracy as per the 7th class of accuracy.
- 15.4 Honing operations:
honing of parts with diameters from 60 to 700 mm, minimum length of honing being 90 mm and maximum length 5000 mm.
- 15.5 Superfinishing and fine diamond grinding of outer surfaces of bodies of rotation providing Ra 0.05 μm roughness.
- 15.6 Deep-hole drilling and boring operations:
deep-hole drilling for rotary bodies with lengths of parts to be machined from 600 to 25000 mm, (length 25000 mm at drilled diameter from 20 to 250 mm) drilled diameters being between 40 and 250 mm, maximum weight of the blank being 250 t.
deep-hole boring operations with diameters of holes to be bored between 250 and 2200 mm and with article length up to 25000 mm.
(L=25000 mm at bore diameter from 80 to 1000 mm,
L=22000 mm at the diameter from 1000...2200 mm)
drilling and boring operations for basic parts and parts like flanges weighing up to 100 t, min. hole diameter 5 mm, max. hole diameter 1100 mm.
gun drilling of holes with the diameter from 10 to 36 mm, maximum depth 1300 and 2300 mm correspondingly in basic parts weighing up to 40 t.
- 15.7 Multi purpose milling of basic parts with intricate sections according to control programs in the machining center.
- 15.8 Gear cutting operations:
cutting of spur, helical and herringbone gear wheels with modules from 1 mm up to 75 mm and diameter of a part up to 10000 mm; diameters up to 2000 mm according to the 7th degree of accuracy;
cutting of worm gear wheels M= from 1 to 30 mm with centre distance up to 2000 mm;
cutting of globoidal worms and gears (gear rings) with M=5 to M=36 mm, diameters of parts being up to 2700 mm and centre distance being up to 1500 mm;
cutting of gear rings, casings, discs with internal gearing from M=1 to M=36 mm and diameter being 4500 mm;
cutting of pinion - shafts with diameters up to 1600 mm, lengths up to 5800 mm and maximal module using a gear hob-30 mm, a disk-type milling cutter-45 mm, an end-mill type gear cutter-75 mm;
- 15.9 Vertical grinding operation:
machining of intricate section of wheel - type parts with diameters from 200 to 3200 mm and height up to 2000 mm according to control programs.
- 15.10 Electric erosion machining operations:
efficient electric erosion machining of parts from hardened and difficult-to-cut materials in the vertical machine within the range from 500 to 3800 mm in diameter and height up to 850 mm.
- 15.11 Fitting - and - assembly operations:

assembly and testing of hydraulic systems, separate cylinders and other vessels under pressure of 1000 atm and speed reducers of various types with a load up to 100 kNm.

16. TOOLS PRODUCTION

- 16.1 Manufacture of cutting tool bodies with ЧП(SNP):
end-type and disk-type milling cutters (\varnothing 100-500 mm b=10-30 mm), face milling cutter (\varnothing 50-315 mm with $j=90^\circ, 60^\circ, 45^\circ$) and milling cutters for chamfering;
drilling-boring heads Δ 38-110mm;
boring blocks with micrometer feed and with boring range of \varnothing 39-655 mm;
boring blocks with preset adjustment and with boring range of \varnothing 23-655 mm;
- 16.2 Manufacture of high-frequency modular attachments for boring and milling machines and other equipment.
- 16.3 Manufacture of cutting tools (taps, reamers, multiflute drills, end-mill type and disk-type gear milling cutters) by steel P 18 and tungsten - free electrodes surfacing.
- 16.4 Manufacture of coarse gear hob cutters.
- 16.5 Manufacture of transfer moulds for production of plastic products.
- 16.6 Manufacture of molds for rubber vulcanization (single-cavity molds and multi-cavity molds) with diameters up to 500 mm.
- 16.7 Manufacture of pneumatic hammers MO6.
- 16.8 Manufacture of vibration dampened pneumatic chipping hammers MPB and compactors ТПВ.
- 16.9 Manufacture of plain gauges to check holes with dia from 6 to 200 mm.
- 16.10 Manufacture of thread gauges (plugs, rings) to check:
metric thread from M5 to M400;
- trapezoidal and buttress threads from 100 to 200 mm in diameter.
- 16.11 Manufacture of devices for the inspection of mean diameters of threads (outer and inner diameters) from 150 mm and more.
- 16.12 Manufacture of drill chucks with operating drill range from 1 to 16 mm.
- 16.13 Manufacture of non-reversible and reversible jaws for lathe chucks.
- 16.14 Manufacture of bench vices with jaw width from 120 to 160mm.
- 16.15 Manufacture of sledges, axes, hammers, knives to planes, wood chisels, chisels of all types, centre punches, letters and figures stamps.
- 16.16 Manufacture of forging and casting accessories.
- 16.17 Precision machining of working members of blanking dies and intricate section parts having unlimited hardness by the method of electric erosion machining which makes the subsequent fitting unnecessary.
- 16.18 Manufacture of fasteners for cutting tools equipped with changeable through-away tips.
- 16.19 Manufacture of fastening equipment for metal-cutting machine tools according to Customer's technical specification.



CAPABILITIES OF THE COMPANY

METALLURGICAL PRODUCTION AND HEAT TREATMENT, MANUFACTURING OF CASINGS 12



PRESS-FORGING AND HEAT TREATMENT FACILITIES, MANUFACTURING OF FORGINGS 13



METAL WORKS FABRICATION 14



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TOOL MAKING 16



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