

PROCESS CAPABILITIES
OF KAMAZ PTC

- KAMAZ PTC is the largest manufacturer of trucks, buses, diesel engines;
- The company is among the top 20 world manufacturers of trucks in terms of volume;
- The trucks are used in more than 80 countries around the world;
- KAMAZ is a repeat winner of the competition "The Best Exporter of the Russian Federation" in the automobile manufacturing industry;
- The range of fully loaded trucks is from 8 to 97 tons;
- KAMAZ owns a branched network of sales and services in Russia and in many foreign countries;
- KAMAZ PTC is an automotive manufacturing of full cycle that unites foundry and forging production, press and stamp, assembly and tool-making facilities and production of engines and powertrains with all the necessary energy and auxiliary facilities.



INDUSTRIAL COMPONENTS KAMAZ LLC

Is dealing with the development and sales of KAMAZ PTC diversification products, being its subsidiary company.

Diversification products are products and services produced by KAMAZ PTC to third-party companies.

Products and services available for our customers:

- Iron, steel and non-ferrous castings;
- Hot forging;
- Stamped and welded parts and units, metal refining, painting and cutting;
- Machining of components, assembling of units and aggregates;
- Equipment of machines with engines, power units and components (axles, platforms etc.) in technical compliance with the customer's requirements;
- Specialized tools and tooling, spare parts for equipment.

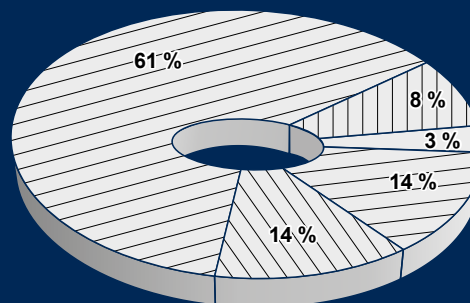
We guarantee our customers:

- Personal approach,
- Reasonable prices,
- Available capacities,
- Accessible location,
- Effective quality management and production system,
- Experienced staff and many more.



Sales volume of diversification products

Vehicle components (crankshafts, engine blocks, body parts, gears and shafts, axles, center point suspensions, truck float bodies etc.)

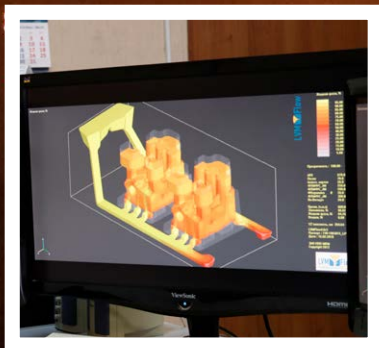


Railway machinery (axle-box bodies and draft gear housings, friction wedges etc.)

Pipeline fittings

Engines and power units

Other (housings of sealing devices, tools, metal products, machining etc.)



KAMAZ PTC foundry plant is a reliable supplier of castings

It executes full process cycle: design, model engineering, development, manufacturing of tooling, castings manufacturing and quality control at all the stages.

Technological and production capacities of the plant allow to produce castings of any kind (including castings of diverse iron grade – with plated and spheroidal graphite, of structural and alloyed steel as well as non-ferrous casting).

Iron casting

Alloy grades:

- SCH 20, SCH 25, SCH 30, SCH 35, VCH 40, VCH 50, VCH 60, CHVG 35, CHVG 45, Special types of SCH and VCH (in accordance to the Russian standards)

Weight of castings 0,1....250,0 kg

Automated molding lines: HWS, CE-Cast, Disa 2013

Flask dimensions, mm:

- 1500*1100*400
- 1100*750*300

Clod dimensions 600*480

Core making machine: Sutter (hot and cold SO₂ process), Laempe, IMF (amine process).

All castings are subject to finishing operations: heat treatment, casting finishing, fettling, priming.

Steel casting

Alloy grades:

- St 20L, St 25L, St 35L, St 32H06L, St 20GL, St 30HML (in accordance to the Russian standards)

Weight of castings 0,1....150,0 kg

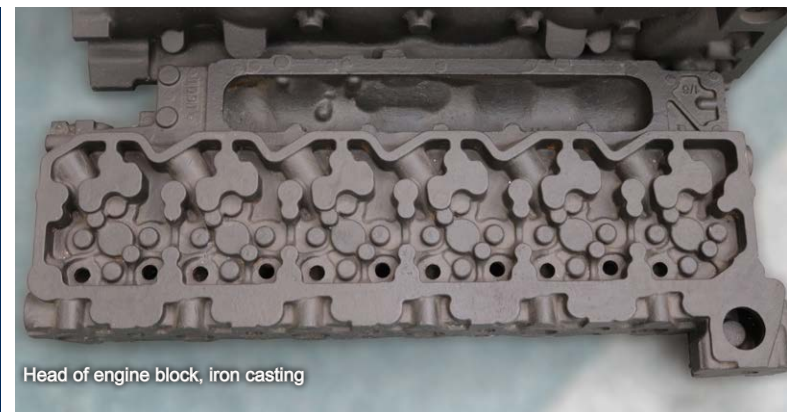
Automated molding lines: CE-Cast, Disa 2013

Flask dimensions, mm:

- 1500*1100*400
- 1100*750*300

Clod dimensions 600*480

Core making machine: U900, 315E (Shalko process).





Non-ferrous castings manufacture

- Aluminum high pressure die casting
Weight of castings: 0,035...6,2 kg
Equipment applied: Wotan, with locking force of 400, 700, 1100 t.
Alloy grades: AK9ch (in accordance to the Russian standards).

- Aluminum low pressure die casting
Weight of castings: 0,96...25 kg
Equipment applied: Dimo and LPM
Alloy grades: AK9ch, AK7pch (in accordance to the Russian standards) and their variations in compliance with state standard.

- Aluminum chill casting
Weight of casting: 0,20...10,2 kg
Equipment applied: Fata
Alloy grades: AK9ch, AK7pch (in accordance to the Russian standards).

- Casting and forging of copper-base alloys under Autoforge technology
Weight of castings: 0,03...0,5 kg
Alloy grades: LMtsSK, LTS-40, BrA10ZhZMs2 (in accordance to the Russian standards).

Continuous casting of copper workpieces:
Workpiece diameter: 25...200 mm, length up to 3000 mm
Alloy grades: LTS-40, LMtsSk, BrO5S5Ts5, BrO10S10 (in accordance to the Russian standards).



Precision casting workshop

- Investment casting
Weight of castings: 0,003...1,5 kg
Alloy grades: St 35L, St 50L, St 40H, St 40HGNML, St 25HGL, St 20H25N19S2L, VCH 50, SCH 20.

- Vacuum investment casting
Alloy grades: INCO-713.

- Vacuum mold casting
Alloy grades: St 20H25N19S2, St 40H25N19S2.

- Workpiece casting for the forging shop dies on thermoreactive mixtures
Alloy grades: 3H5MNFSL.

Production of foundry pattern equipment

A complete work cycle includes both design and production from the workpiece to the finished tooling – press mold, chill, core boxes, models, dies, appliances.

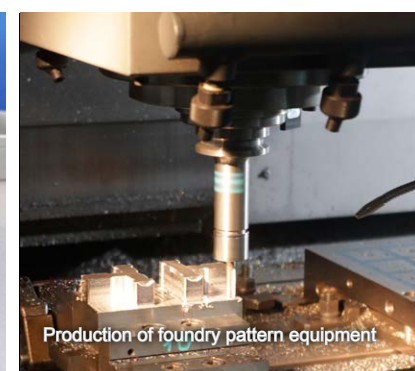
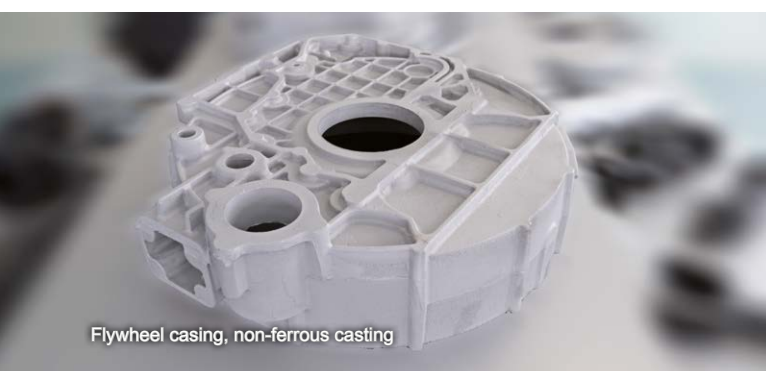
Simulation of foundry processes in programs: Siemens NX11 LVM Flow, ProCast.

Foundry pattern equipment workshop is supplied with the machining centers and the NC machines.

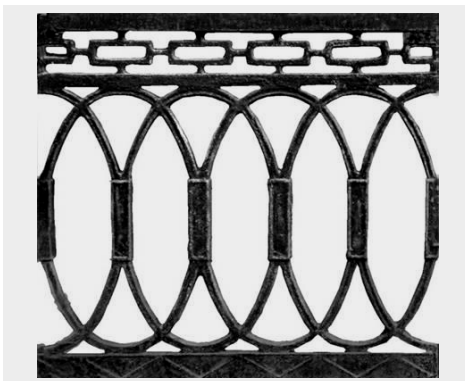
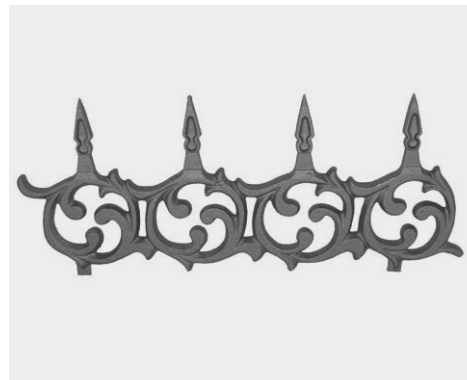
Accuracy check of the manufacture is implemented by means of Karl Zeiss coordinate measuring machine.

Central laboratory of the facility

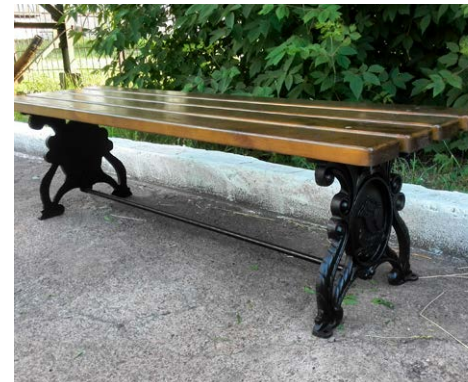
- Spectral analysys equipment (Spectrolab, OBLF, PMY-Master);
- Metallographic equipment: (durometer HPO-3000, HPO-250, TSH-2M, TB-5004, tearing machines, inverted metallurgical microscopes);
- Analytic equipment (carbon and sulfur analyzer, gas chromatograph);
- Nondestructive control method equipment (X-ray TV unit, ultrasonic instrument);
- Testing equipment (climatic chamber).



Production of fences, railings

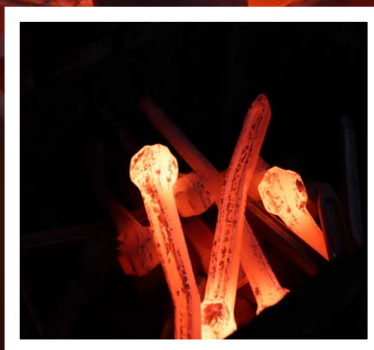
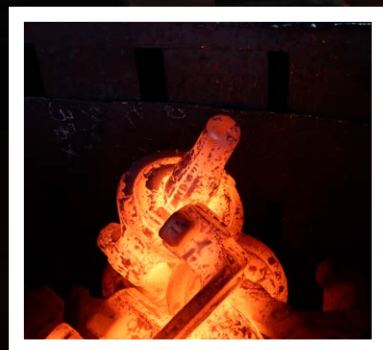


Production of street furniture



Production of gully gratings, chargrills, litter bins and other outdoor amenities with a full process cycle: from design and preproduction, to product launch and sales





KAMAZ PTC Forging plant

A company with a full process cycle: production engineering, design, tooling and forgings manufacturing

Product range: crankshafts, beams, axle shafts, axle swivels, levers, axles, gears etc.

Technologies applied:

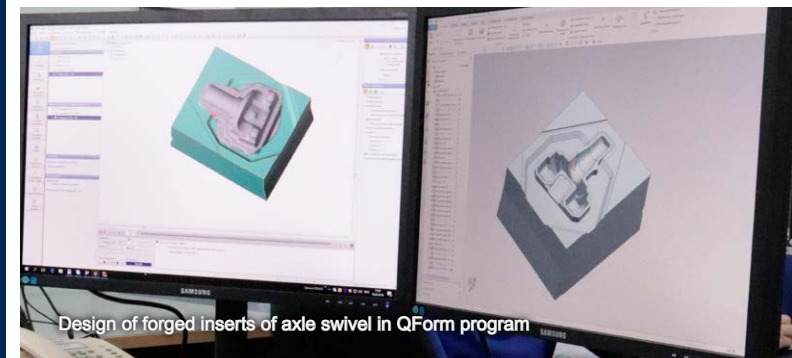
- Modern design and manufacture method of tooling system CAD-CAM-CAE,
- Unigraphics NX4 is applied for 3D tooling design,
- Hot forging process simulation in Qform pack,
- Hot forging with preshape (milling process on ARWS-1/1a/2/2a),
- Shafts upsetting with set of workpieces of minor section and cross-wedge rolling of shafts for hot forging.

Equipment applied:

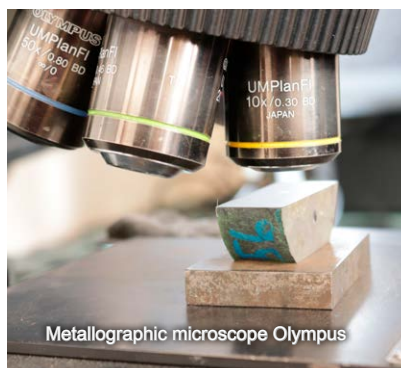
- Smeral eccentric hot stamp press (with force 1000 tons, 1600 tons, 2500 tons, 4000 tons, 6300 tons),
- Oumuco presses (with force 12000 tons),
- Hasenklever horizontal forging machine (with force 250 tons, 500 tons, 630 tons, 800 tons, 1250 tons, 2000 tons, 3150 tons),
- SP-5000 wedge rolling mill.



Custom-tailored die tooling for the forging production of the valve rocking arm on NC machines.



Design of forged inserts of axle swivel in QForm program



Metallographic microscope Olympus



Equipment for measuring of hardness of forgings



Design of a mathematical model of a crankshaft forging in QForm program





Manufacturing range:

Hot forgings manufactured on mechanical hot stamp presses and horizontal forging machines in compliance with the state standard GOST 7505-89, DIN 7526 (accuracy class, mostly F, in rare cases E)

Weight of forgings: 0,1...100 kg

Applied materials: carbon and alloy steel in compliance with the state standard GOST 1050-88, GOST 4543.

Equipment characteristic:

- Crankshaft line: forging length up to 1120 mm, weight up to 122 kg.

- Beam line: length up to 1900 mm, weight up to 110 kg.

- Hot forging crank driven press: elongated forgings – length up to 250 mm, weight 0,12...2,56 kg. Round forgings up to Ø150 mm, weight – 0,12...2,56 kg.

- Hot forging crank driven press: elongated forgings – length 250-500 mm, weight 0,63...20 kg. Round forgings – Ø 150-240 mm, weight – 0,63...20 kg.

- Hot forging crank driven press: elongated forgings – length up to 870 mm, weight 3,7 ...33 kg. Round forgings – Ø240-350 mm, weight – 3,7 ... 33 kg.

- Horizontal forging machine: length up to 1295 mm, weight – 0,2...42 kg.

- Axle shafts line: length up to 1295 mm, core Ø - 40-50 mm, weight 11,2 ...27,9 kg.

- U-bolt line: Ø 18,94 mm, Ø 22,9-28,6 mm, length up to 460 mm.

Forged insert of crankshaft die tooling, manufactured on NC machines



Forging: gear



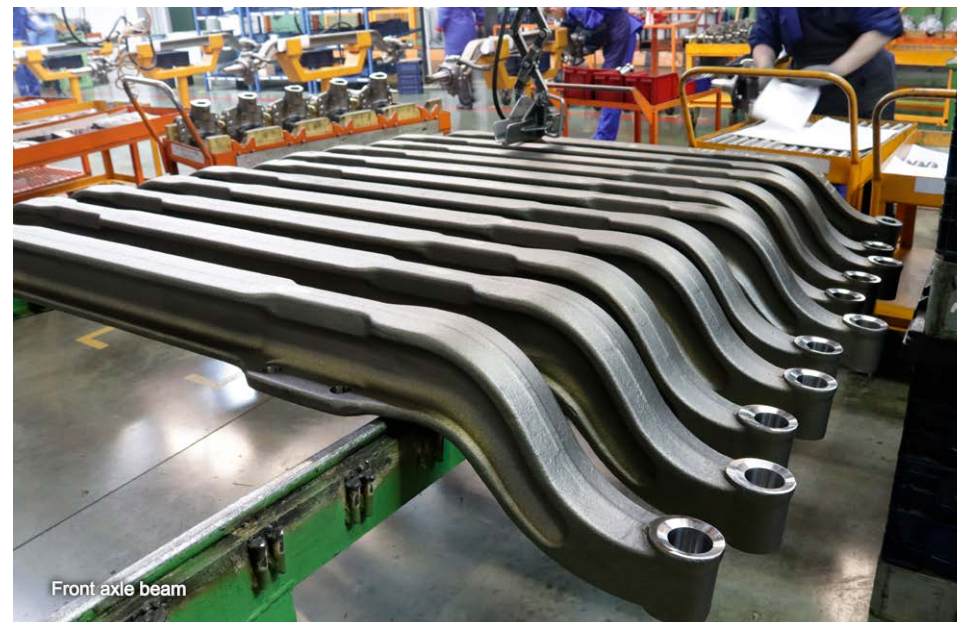
Forging: stabilizer link



Forgings: flange, lever, bracket



Crankshafts for passenger cars



Front axle beam



Forgings of different geometric form and ranges of complexity



Gears



KAMAZ PTC Press and Stamp plant carries out the following:

- Metal cleaning and cutting, painting of metalware.
- Stamped and welded components and units production.
- Stamp and die tooling production.
- Production and supply of strip (metal band) and steel cards (steel stripes) in compliance with the customer's request.

KAMAZ PTC Press and Stamp plant comprises the following production lines:

- Blank production (cleaning, flattening, oiling, cutting of rolled metal in sheet /stripped form. Thickness of a treated metal – 0,7-15 mm).

Production and supply of strip (metal band) and steel cards (steel stripes) in compliance with the customer's dimensions. Cleaning and oiling is implemented on RÖSLER line;

- Assemble-welding production (frames assembly, subassembly, welding of car frame and fin assembly, welding of chassis units and vehicle flat bodies, machining of brackets etc.);

- Stamping (cold stamping of side rails, transverse frames, brake pads, fuel tank components, silencer parts, air cylinder parts, inserts, cabin components and fin assembly, suspension components, levers, vehicle body parts; hot forging of drive axle housing beam);

- Painting (surface preparation of parts, chassis units, frames; electrophoretic method of priming and single layer of enamel VML-0143; frames and body painting undergoes a seven-stage sequence of surface preparation, anodic electrodeposition coating of DRX 0207 and 2 layers of enamel painting).

- Stamp manufacturing workshop produces small size, middle and large size stamps, gauging fixtures and models.

The workshop comprises 7 machining centers located separately including 2 Mitsubishi machining centers for the production of large stamps and 5 units of tracer-controlled milling machines with NC machines based on mathematical models.

The workshop produces stamps of weight range from 30 kg to 80 tons.



Frames and side rails



Rear drive axle beam



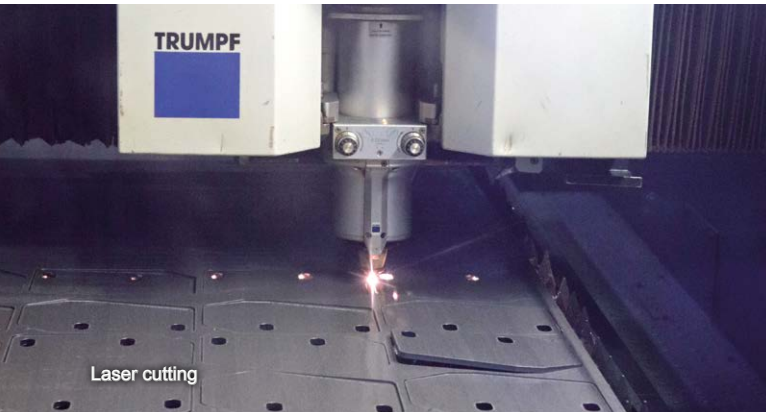
Hot forging



Large stamping



Stamping of frame elements



Laser cutting



Plasma cutting



Section and side rails bending



Pipe bending



Applied equipment:

- Cutting lines Komatsu and KPO (Azov city)
- Cleaning, flattening, oiling, cutting of rolled or stripped metal on RÖSLER RRB 22/5, PLASMA NOVA lines;
- Plasma cutting on SOITAAB;
- Bosio furnace;
- Shot blasting COGEIM;
- Pipe bender (Taiwan) with NC machine for bending of stainless steel pipes Ø 38-60 mm and Ø 80-120 mm, pipe-end forming machines (Switzerland), belt-saw machines;
- Automatic welding lines, resistance welders, point welding machines, multielectrode machines;
- Durr painting line;
- Zeiss measuring laboratory, Ficep (Italy) plasma equipment, TRUMPF (Germany) equipment; edge bending with force 200 t, length – 2000 mm, 5 laser units with replaceable pallets (1500x3000 mm);
- Mitsubishi machining centers for the production of large stamps, tracer controlled milling machines operated by NC machines.





KAMAZ PTC Engine plant carries out the following:

- Full process cycle of production of diesel and gas engines, power units, clutches, gearboxes and their spare parts
- Products and services range: engines and power units, power drives, vehicle components: gearbox, transfer box, clutch etc.

Applied equipment:

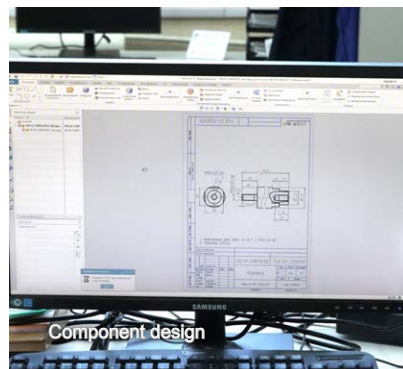
- Emag, Liebherr, Reshauer, Boehringer, Mitsubishi hi tech machines and lines;
- Assembly, painting, welding, metal cutting equipment, thermal units, automatic electrotype units.

Along with the production of engines and power units KAMAZ PTC Engine plant accomplishes the following:

- Cooperates with the producers of various application machinery;
- Develops engine and power unit sets in compliance with the customer's requirements;
- Sells vehicle components;
- Develops components and units;
- Performs services of industrial type (thermal and galvanic machining, machining process).



Component design



Component design



Piston rods



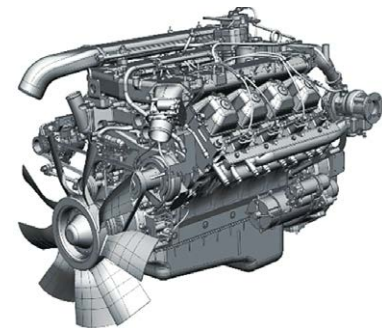
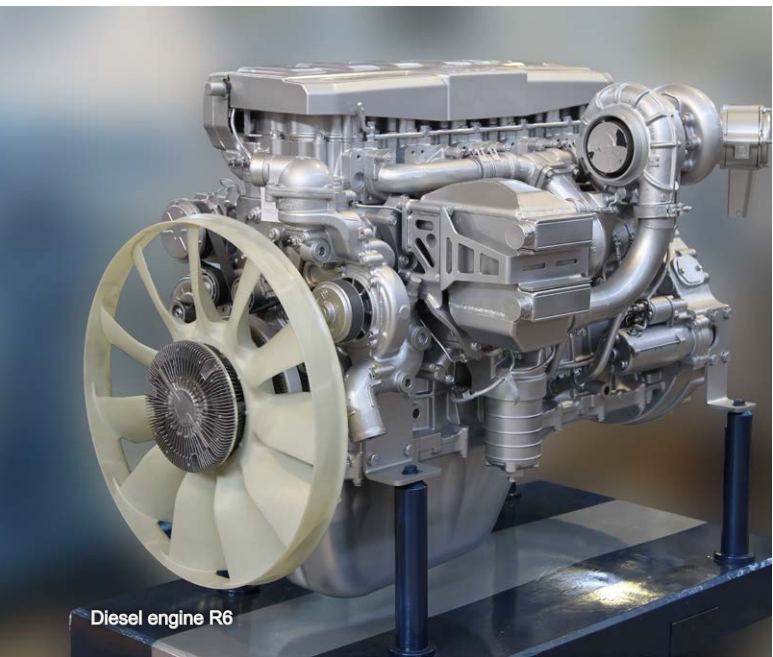
Flanges



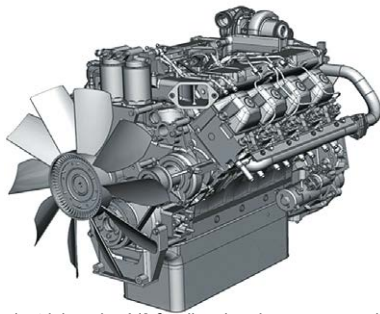
Performance indicators of KAMAZ modern engines complies with the engines of the leading world producers and has the best weight-and-dimensional characteristics.

Kamaz engines range

Engine	Type	Volume, liters	Power, HP					
			200	300	400	500	600	700
Cummins	P4	4,5						
	P6	6,7						
KAMAZ	V8	11,76						
	V8 gas	11,76						
	P6	11,94						



Gas engine V6



Industrial engine V8 for diesel and gas power units, range from 60 to 200 kWt

Power units are supplied with set of supplementary components on the basis of Cummins inline diesel engines of ISBe series.

Components produced by the Engine plant of KAMAZ PTC are the following:

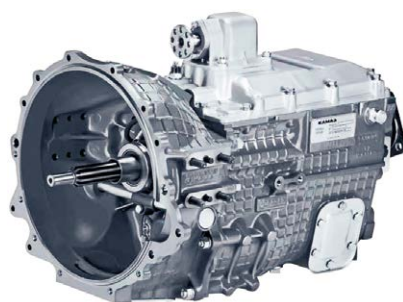
KAMAZ gearbox:

- 5 step models 141, 142
- 10 step models 151, 152, 154

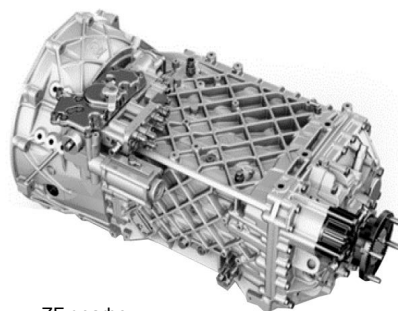
Transfer box RK 6522 for all wheel drive vehicles of heavy payload fully loaded weight 30-40 tons with engines range from 320-420 h.p

Gear boxes produced by Joint Venture company "ZF KAMA" Naberezhnye Chelny:

- ZF Ecomid-9S1310, 9S1315
- ZF Ecosplit-16S1820, 16S1825



KAMAZ gearbox



ZF gearbox



KAMAZ transfer box





KAMAZ PTC Truck assembly plant carries out the following products and services:

- Rear driveline gears and axle shafts, satellites of interaxle differential,
- Front/intermediate/rear axle of special application with or without ABS/drive gear,
- Center point suspensions, suspensions of special performance,
- Service kits of front/intermediate/rear axle housing of hub group of special performance,
- Float bodies of special performance etc.

Truck assembly plant accomplishes a serial production of components and units of trucks, such as:

- Drive shafts,
- Front axles, shafts,
- Balanced suspensions

as well as the assembling of trucks on the trunk conveyor of KAMAZ PTC.

The equipment of leading manufacturers from Germany, Italy, the USA is applied in the plant. It comprises the following:

High-tech machines and machining lines, assembly, painting and welding equipment by Liebherr, KUKA, Gleason, G.Fisher, Heckert.

The products manufactured are certified and are in compliance with the state standards GOST R ISO 9001-2011 (ISO 9001:2008).

We offer the following range of products and services:

- The production of front/intermediate/rear shafts of special performance on 43114, 55111, 6520 chassis with both including and excluding ABS and drive gear;
- Center point suspensions of special performance on the basis of 43114 (single-slope), 55111, 6520 (dual-slope) both including and excluding ABS.



Cardan shaft



Brake wheels



Shafts production



Service kit of reducing gear



Service kits, front/intermediate/rear axle housing, hub group of special performance on the basis of KAMAZ 43114, 55111, 6520

Cardan shafts production

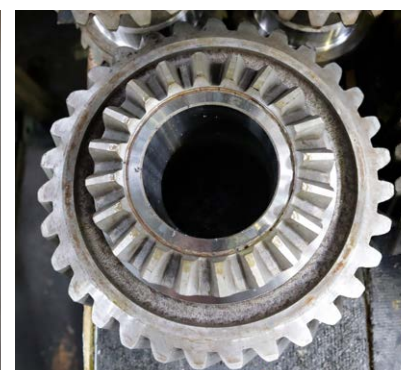
Cardan shafts:
L=820...1780 mm,
D=150, 180 mm,
d=135, 155 mm,
Dpipe=82x4, 94x4 mm
Torque 9300, 11760 Hm

Mechanical assembly production includes the production of the following range of products:

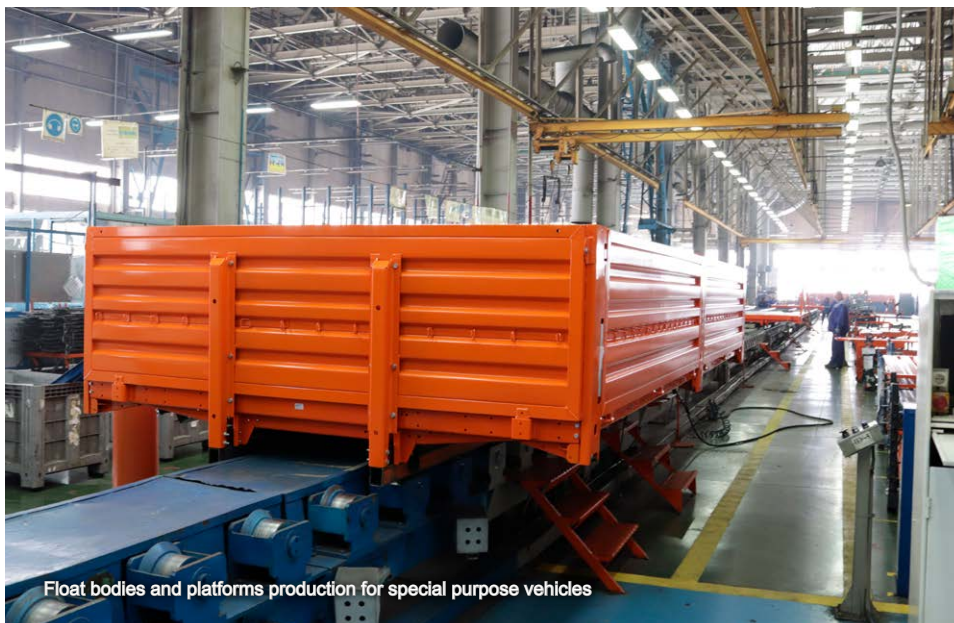
- gears of rear driveline,
- satellites of interaxle differential,
- rear end axle shaft gears,
- driving cylindrical gears.



Gears



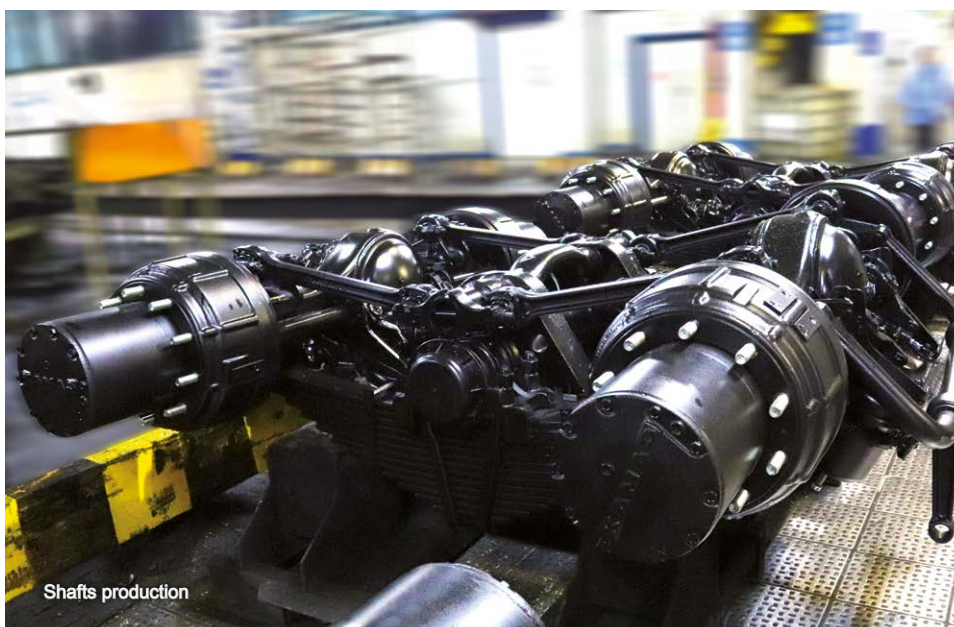
Cardan shafts



Float bodies and platforms production for special purpose vehicles



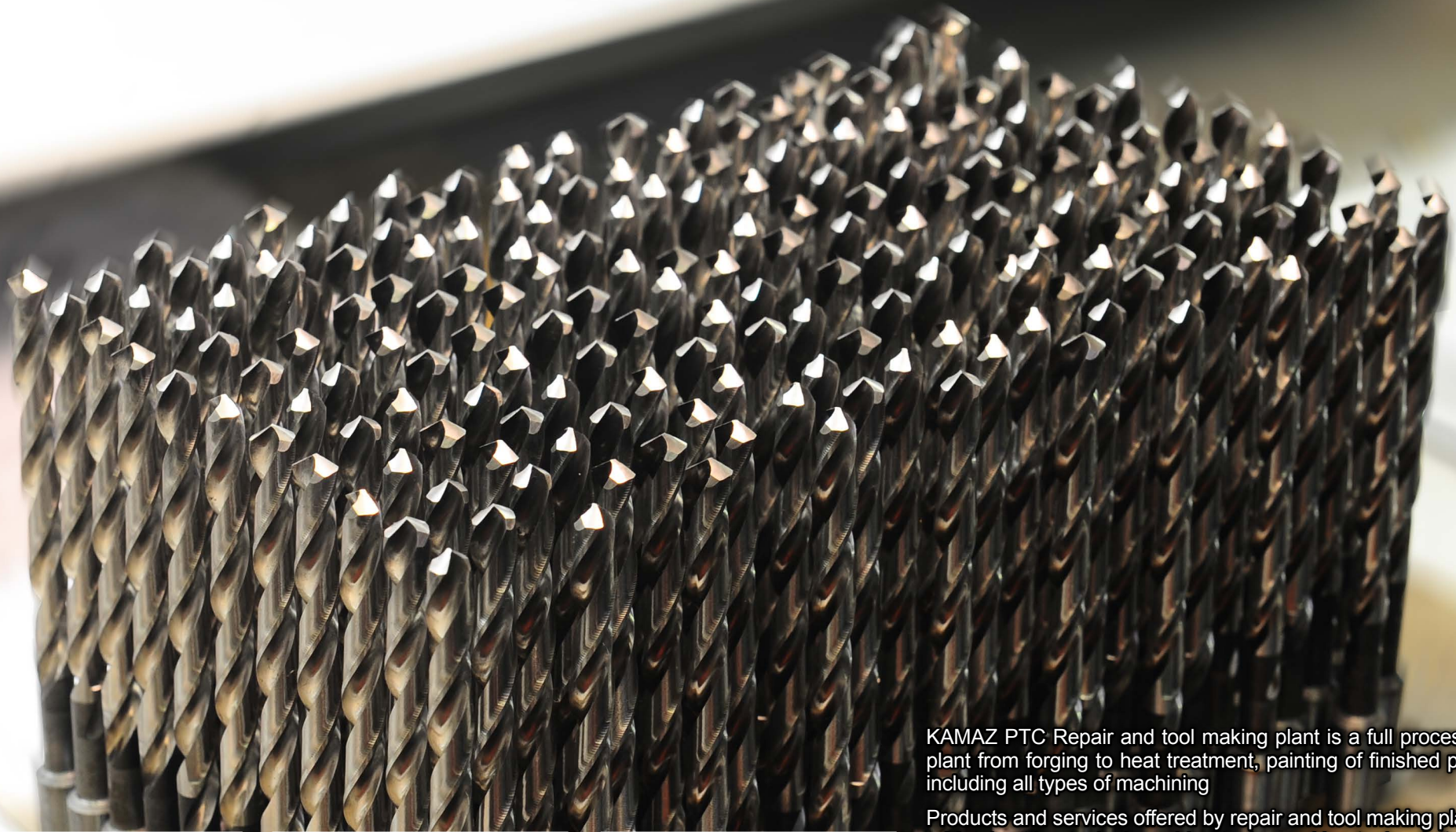
Production line of front axle



Shafts production



Bevel gears



KAMAZ PTC Repair and tool making plant is a full process cycle plant from forging to heat treatment, painting of finished products including all types of machining

Products and services offered by repair and tool making plant:

- Metal-cutting tools: broaching tools, marking tools, slotter rams, drills, shaving cutters, milling cutters;
- Backup tools: holders, filling blocks, collets, flaring tools, stub flanges;
- Measuring tools: internal gauge, profile gauge, checking fixtures;
- Pneumatic tools: pneumatic actuator, power screwdriver, reducing gearbox, as well as balance beams for hanging them up;
- Spare parts and the machine-tool attachment;
- Small-sized metal ware: swing sets, lawn fences, playgrounds;
- Repair of production machinery, tool refurbishing, smoothing of bed plate and body parts.



Applied equipment:

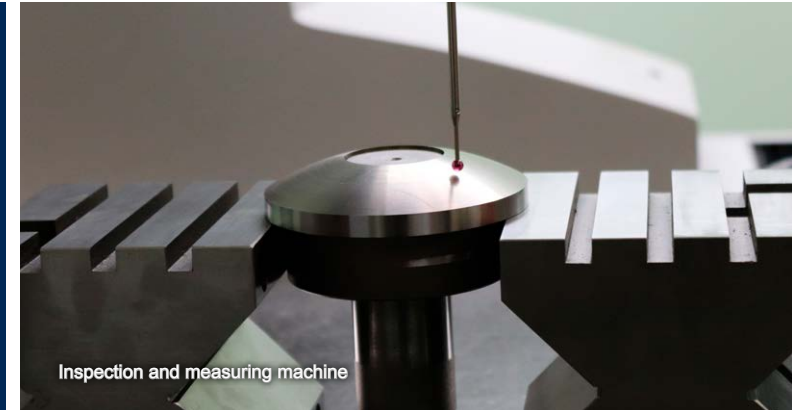
All-purpose and special purpose equipment of high resolution with full production cycle, including machining of components of any complexity.

Manufacturing technology is oriented on progressive machining methods:

- profiled;
- diamond;
- electro erosive;
- wear resistant coating application, with the application of highly efficient native and imported equipment that jointly ensure high product quality.

Our advantages:

Provision of full production cycle of irregular special purpose tools from its project engineering up to coating application including design studies, engineering support of orders and all the necessary types of machining operations.



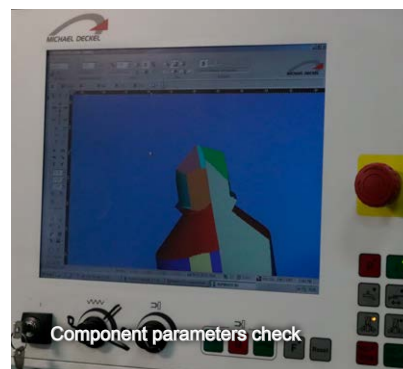
Inspection and measuring machine



Mitsubishi machining center



Hydroabrasive treatment unit



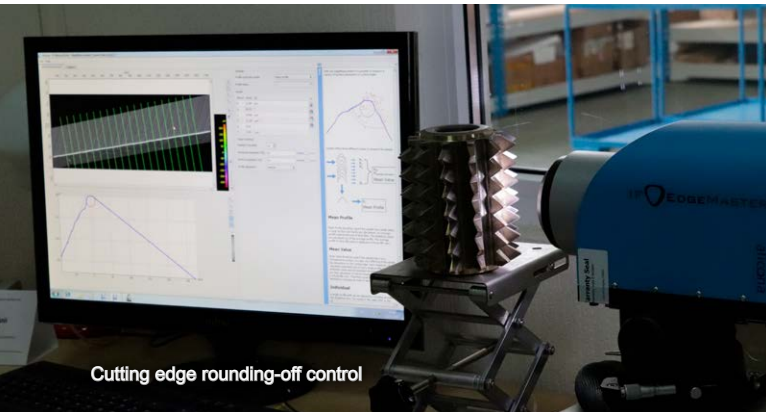
Component parameters check



Component parameters check



Measuring tool



Cutting edge rounding-off control



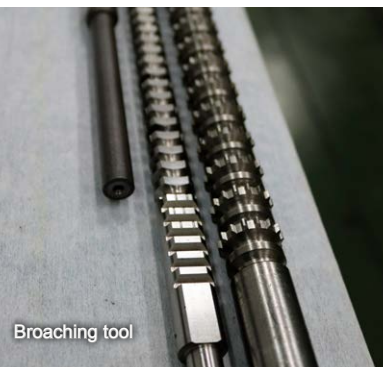
Milling cutters



Burnishers

Manufacturing range:

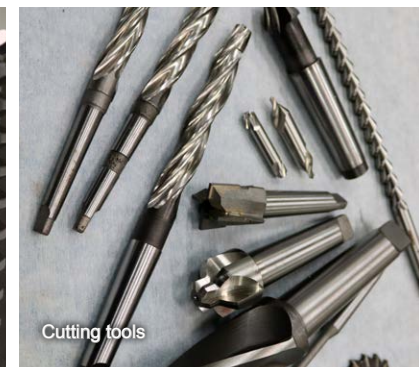
- Production of metal-cutting tools;
- Broaching tool for splined holes:
 - with straight-sided flanks,
 - for splined holes with involute profiles,
 - of spline type,
 - of rounded type,
 - of flat type,
 - of facet type (4,6);
- Milling cutters of:
 - worm-type,
 - cut type,
 - edged end mills,
 - profiled end mills,
 - cone-shaped end mills,
 - assembled,
 - frontal wholesome,
 - assembled,
 - disk type wholesome 2 faceted,
 - 3 faceted,
 - disk type, assembled 2 faceted,
 - 3 faceted,
 - disk and modular type,
 - finger-type;
- Drills of the following type:
 - spiral,
 - auger-type,
 - with reinforced core,
 - wholesome hard alloy type,
 - assembled with disposable plates,
 - assembled with soldered plates;
- Broach bits:
 - wholesome for through holes,
 - wholesome for dead-end holes,
 - mounted on type for through holes,
 - assembled type for mechanical mounting of hard alloyed plates,
 - with soldered plates,
 - of mounted on type;
- Cutters of the following type:
 - with reverse geometry,
 - passing through,
 - copy,
 - cut,
 - drilling,
 - channel,
 - shaped,
 - relieving,
 - gear-shaping,
 - radial,
 - profiled,
 - cut,
 - shaving,
 - slotting,
 - threaded;
- Marking tools, reamers, rollers of thread-rolling type, shaving cutters, slotter rams.



Broaching tool



Worm-type milling cutters



Cutting tools

Assembly tool production:

Multi-spindle assembly tool:

- without shutdown,
- with mechanical shutdown upon fixing torque,
- with electronic shutdown upon fixing torque,

A wide range of pneumatic tools:

- pneumatic drives,
- sanding machines,
- angle tools,
- striking tools,
- pistol-grip nut runners,
- balance beams for hanging up of the above listed tools.

Manufacturing of the spare parts for the equipment:

- cylindrical wheels, discs, (outer and inner engagement);
- worm gearing;
- bevel wheels (with straight and rounded tooth);
- serrated railings;
- sprockets for chains;
- shafts, plungers, subjacent intrusive;
- rolling screw-motion drive;
- rollers, flanges;
- body parts;
- spindles, spindle units;
- coil springs, cut type spring bushings;
- welding on of crane wheels.

Manufacturing of forgings for the equipment of the cutting tools, press forms, spare parts to the equipment, reforging of metal upon the customer's request.



Holders



Collets



Pneumatic tools



Spare parts



Serrated discs



OUR DEVELOPMENTS

Mobile gas filling station on NEFAZ semitrailer is applied for fueling of trucks and agricultural vehicles with gas (methane).

Ambient operating temperature is from -50 °C up to +40 °C

General energy consumption - 85 kW

Number and type of fuel-filling columns - 2 pcs, NGV2

Availability and type of discharge gages of released gas – mass discharge gages, 2 pcs. Compressor unit

Output pressure - 20 Mpa

Inlet pressure, bar	Productivity, m³/h
25 (min)	300
50	700
100	1500
150	2100
200	2800

Compressor type – hydraulic 2 staged compressor B55, 1 pcs.

Drying unit and gas purifying

Type of drying – adsorptive

Mass of adsorbent in one line of adsorbers 26 kg

Switching of cranes – automatic.

Work mode control – automatic

Gas pressure loss in drying unit – no more than 0,5 Mpa

Time of adsorbent regeneration – 8-10 hours

Consumed energy during regeneration - no more than 5,0 kW

Gas accumulator unit

Volume of gas accumulator units – ballons 10x100 l

Working pressure – 24,5 Mpa (245 kgf/sm²)

Maximum quantity of filling stations – no less than 15 000

Basic features of NEFAZ semi-trailer, model (9334-10)/9327

Tires size – 9,00R20; 11R22,5, 10,00R20, 425/85 R21

Technically allowable fully loaded weight of semi-trailer 27 000 kg.

Technically allowable maximum weight, per:

- Towing unit - 11000 kg

- Front axle - 8000 kg

- Rear axle – 8000 kg

Mobile gas filling station weight – 19590 kg



Fueling of KAMAZ trucks with methane







Contact details

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