145 YEARS OF EXPERIENCE

Kredmash

ASPHALT MIXING PLANTS

- Development
- Manufacture
- Sale
- Assembling

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"KREDMASH" – your time-tested partner.

Public joint-stock company "Kremenchug Plant of Road Machines" ("KREDMASH") is the leading manufacturer of road-building machinery in the world. The history of the plant started in 1870. A considerable way of creation of a successful enterprise has been covered. During recent 65 years the steadily operating and dynamically developing enterprise has been specializing in working out, manufacturing and putting on the market asphalt mixing and soil mixing plants as well as specialized vehicles. More than 21 thousand asphalt mixing plants have been produced since 1949. The products of the enterprise are exploited in more than 50 countries of the world. "KREDMASH" asphalt mixing plants can operate for 30 and more years.

Nowadays "KREDMASH" company offers new generations of asphalt mixing plants meeting all modern requirements as to ecological compatibility, reliability of operation, quality of manufactured asphalt. Quality policy is one of the priority lines of the enterprise. Quality Management System at PJSC "KREDMASH" is confirmed by the Certificate of Conformity stating that the products meet the international standard of quality demanded by ISO 9001-2000.

Application of up-to-date technologies and structures, flexible response to consumers' requirements make it possible to manufacture high-quality products and meet customers' needs more completely: sell the whole offer of the equipment, original spare parts and consumables, perform assembling, commissioning and flaw detecting, perform warranty, modernize plants manufactured in previous years, train specialists.

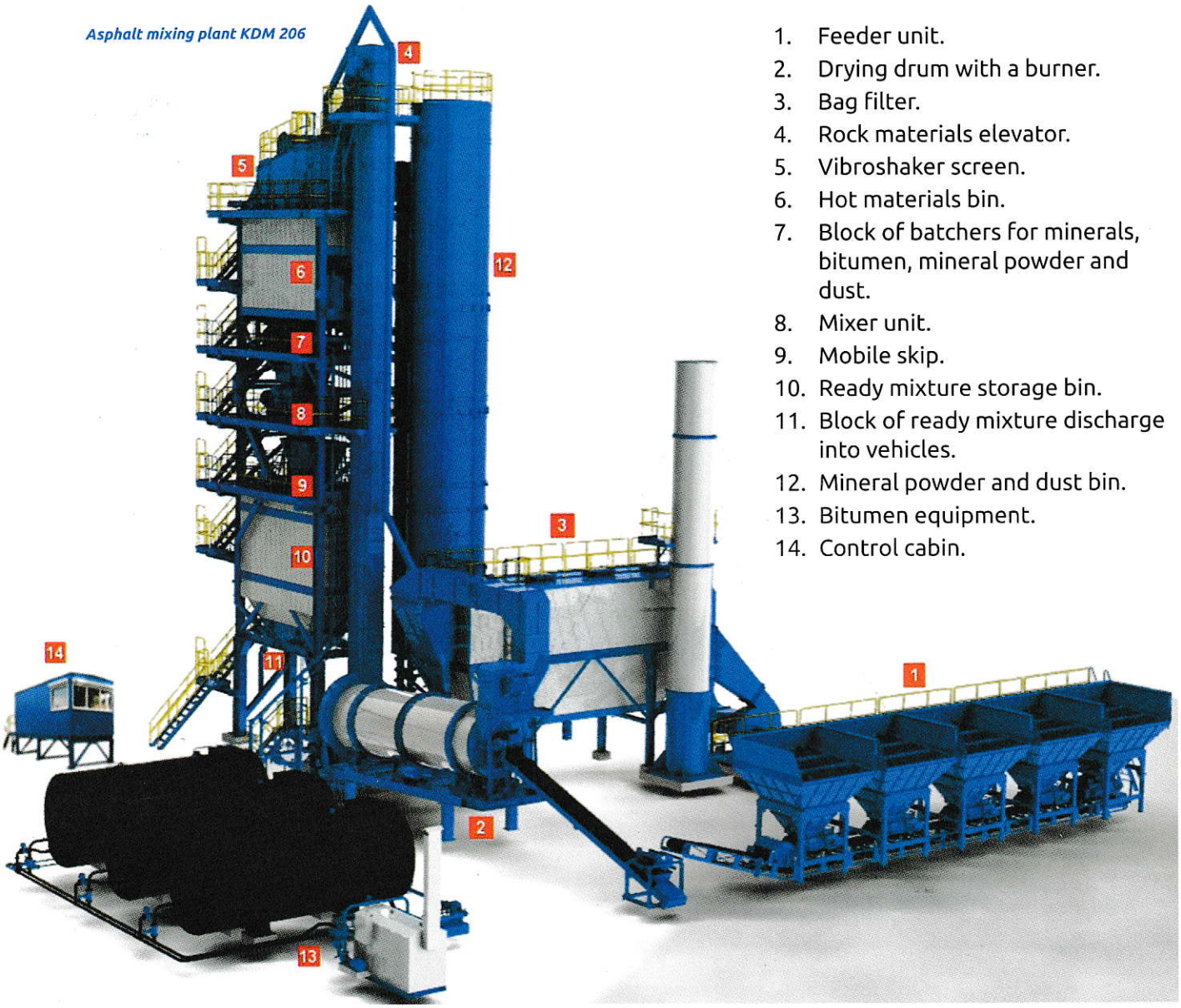
Competitive advantages of "KREDMASH" plants:

- up-to-date European technologies;
- long-term experience of asphalt mixing plants design and manufacture;
- optimum price/quality ratio;
- servicing simplicity and convenience;
- branched dealer network;
- efficient and high-quality service;
- the equipment is supplied within 5-30 days;
- "KREDMASH" plants operate in all road organizations of Russia, CIS countries and are known far abroad;
- manufacturing plants as one-off jobs taking into consideration customer's requirements and kitting-up;
- plants can be painted any color according to the consumer's wish.

New generation of asphalt mixing plants.

PJSC "KREDMASH" develops a new family of asphalt mixing plants of KDM 205 type of the capacity of 200 tons/h and KDM 206 of the capacity of 160 tons/h. The main blocks and units are made in auto dimension. The standard complete equipment of the asphalt mixing plant includes: a feeder unit with frequency-controlled feeder productivity, an oversize separation grid, a conveyer, a drying unit with a dust cleaning system based on bag filters regenerable by traction of smoke exhauster, a dust unit with the possibility of feeding caught coarse fraction dust to the "hot" elevator, a mineral powder unit, a mixing tower with a five- or six-fraction (for choice) system of rock materials sieving and batching, a system of improved accuracy of batching of asphalt-concrete mixture components, with heat-insulated "hot" materials bins and ready mixture bins, equipped with electric heating of bolts and inclined walls, a bitumen equipment package (bitumen tanks, bitumen communications, pump units) with an oil heat generator and bitumen heating due to high-temperature heat medium. The control system provides a remote connection with the manufacturer and control of the plant operation from the customer's office. The following is offered optionally: twice as big (up to 170 t) volume of ready mixture bins, cellulose addition unit, an expanded reservoir for mineral powder, bitumen, equipment for modification of bitument with liquid and polymeric additions.

Asphalt mixing plant KDM 206



1. Feeder unit.
2. Drying drum with a burner.
3. Bag filter.
4. Rock materials elevator.
5. Vibroshaker screen.
6. Hot materials bin.
7. Block of batchers for minerals, bitumen, mineral powder and dust.
8. Mixer unit.
9. Mobile skip.
10. Ready mixture storage bin.
11. Block of ready mixture discharge into vehicles.
12. Mineral powder and dust bin.
13. Bitumen equipment.
14. Control cabin.

Specification of new generation asphalt mixing plants

Specification	KDM 206	KDM 205
Nominal capacity at the humidity of initial materials (sand and broken stone) up to 3%, tons/h	160	200
Installed power, kW, maximum	450	600
Capacity of feeder bins, pcs.xm^3	5x12=60	6x12=72
Feeders types	belt-type, adjustable via frequency converter	
Width of the conveyers belt, mm	650	800
Drying drum, Ø×L, mm	2200x8400	2200x9000
Drying drum drive	adjustable, with smooth start-up, speed change via frequency converter (optionally)	adjustable, with smooth start-up, speed change via frequency converter
Type of drying drum drive	gearing with one motor-reductor	frictional with 4 motor-retuctors
Power of drying drum drive, kW	45	4x15=60
Power of burner, MW	12	15-17
Fuel type	at choice: liquid or gaseous	
Type of screen	inertial, self-balanced with two electric vibrators	
Power of screen drive, kW	2x7.6=15.2	
Area of screen sieves 5/6 screen decks, m^2	25/28	
Number of fractions of batched rock material, pcs.	5-6	
Type of the system of batching accuracy improvement	valves dual pneumatic cylinders for dribble feed mode and algorithm of automatic correction of taken batches	
Capacity of rock materials batcher, kg	3000	
Capacity of mineral powder and dust batcher, kg	600	
Capacity of bitumen batcher, kg	315	
Capacity of hot rock materials bin, m^3	31	
Type of level sensors in hot rock materials bin	continuous level capacitive sensors	
Heat insulation of hot rock materials bin	available	
Maximum mass of a batch, kg	2200	3000
Power of mixer drive, kW	55	2x37=74
Ready mixture bin/ capacity m^3 (t)/number of compartments	compartment of direct unloading – 3.5(5.95); 2 ready mixture compartments - 2x22(37.4); option: 2 additional ready mixture compartments -2x27(45.9)	
Total volume of ready mixture m^3 (t) (at poured weight 1.7 t/m^3)	50(85) or 104(176.8) (optionally)	
Capacity of mineral powder unit bin, m^3	45	
Capacity of dust unit bins, m^3	50	
Type of dust catching device	bag filter regenerable via smoke exhaust draft	
Area of bag filters filtration, m^2	550	725
Batchers type	weighing on bend strain gauges	
Total capacity of bitumen tanks, m^3	3x30=90	
Type of bitumen heating element	Coil pipe with thermal oil	
Total area of the coil pipe heat exchange in one tank, m^2	55	

Review of series-produced asphalt mixing plants.

Asphalt mixing plants of the capacity of 56, 64 tons/h. DS-185

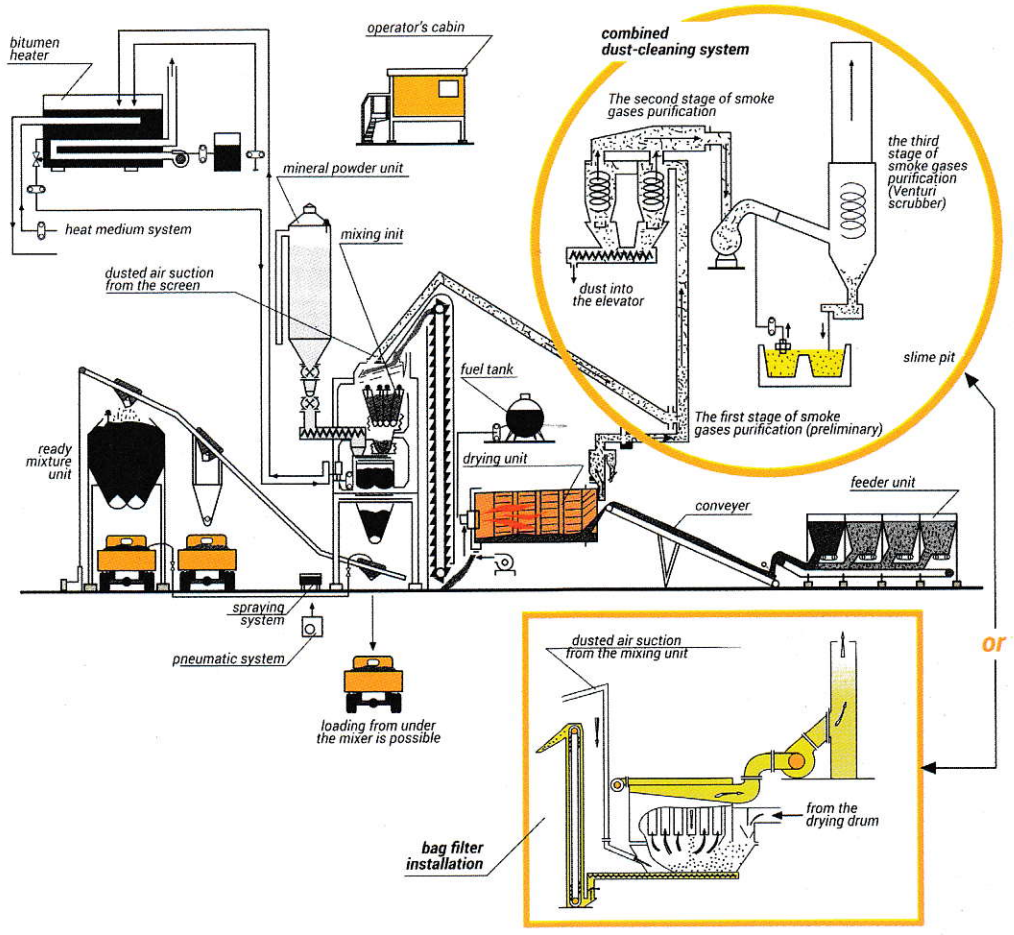
Due to constant innovations introduced into the design during many years, asphalt mixing plant DS-185 of the capacity of 56 tons/h has proved to be a reliable and high-quality model for small scope of work.

A particular feature of plant DS-185U consists in the presence of a dust unit with its own elevator able to batch dust and utilize excesses. It allowed considerable improvement of asphalt quality when material with increased content of dust is used. Due to structural changes, electric energy specific consumption is reduced, batching accuracy is improved, capacity is increased up to 64 tons/h.

Asphalt mixing plants DS-185U mobile, ground-type capacity of 64 tons/h

Asphalt mixing plant DS-185U, mobile, ground-type. Capacity – 64 tons/h. Asphalt mixing plant DS-1857A (of the capacity of 56 tons/h, is manufactured in auto dimension).

Process flow diagram of asphalt mixing plant DS-185



Asphalt mixing plants of the capacity of 110 tons/h KDM 201

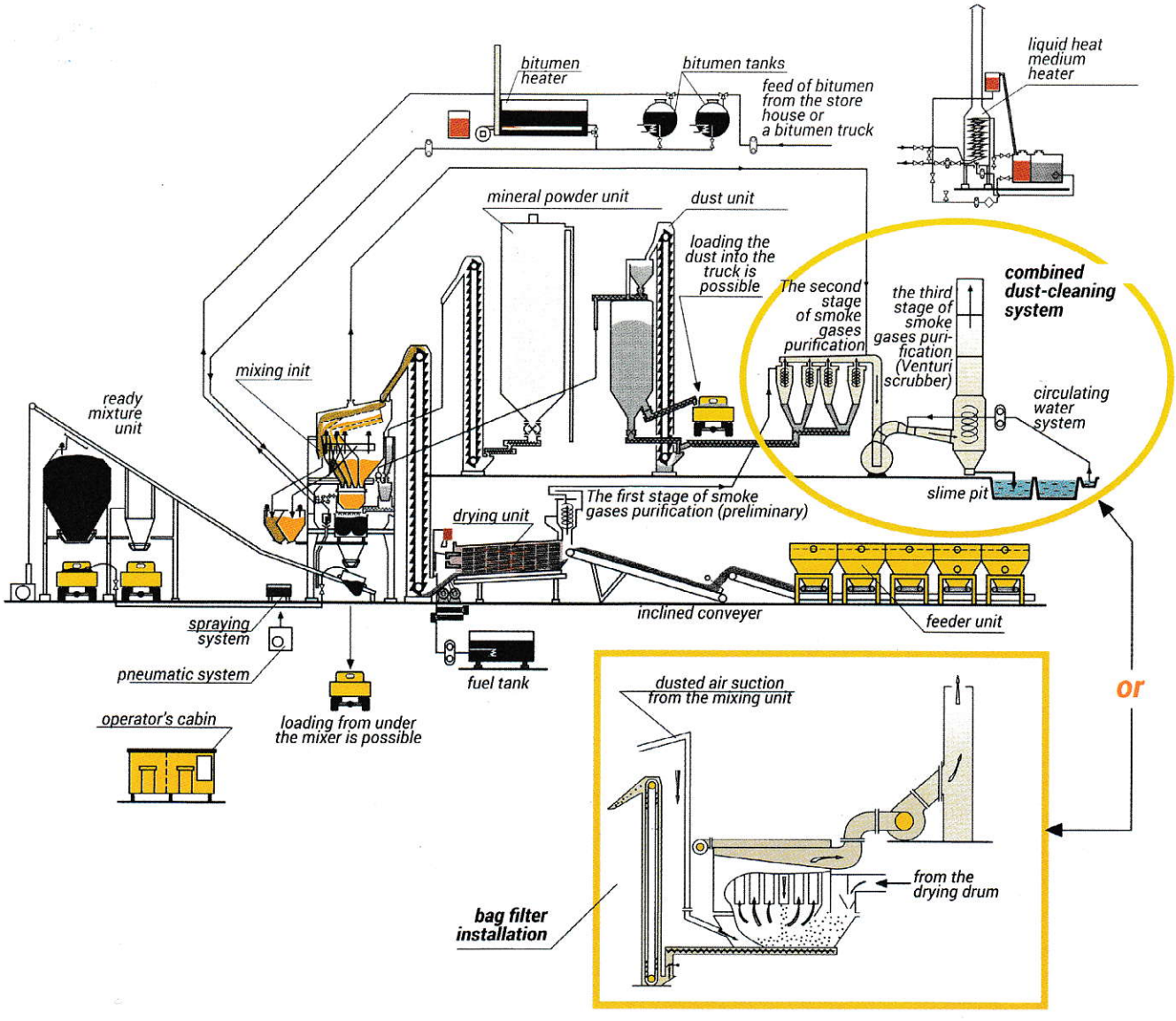
Providing preparation of mixture up to 110 tons/h, plant KDM 201 occupies a special position in the group of middle-performance plants.

Plants KDM 201 are based on time-tested technologies of PJSC "Kredmash" and can be additionally equipped with a variety of sets and options; they proved to be reliable, maintainable, adjustable plants. KDM 201 plants have been sales leaders during several recent years.

Technical innovations are constantly introduced into KDM 201 design, which allows the plants to meet ecological norms and customers' requirements for many years.

Tower-type asphalt mixing plant KDM 201637B. Assembled in the city of Naberezhnyie Chelny, Republic of Tatarstan, Russian Federation.

Process flow diagram of asphalt mixing plant KDM 201



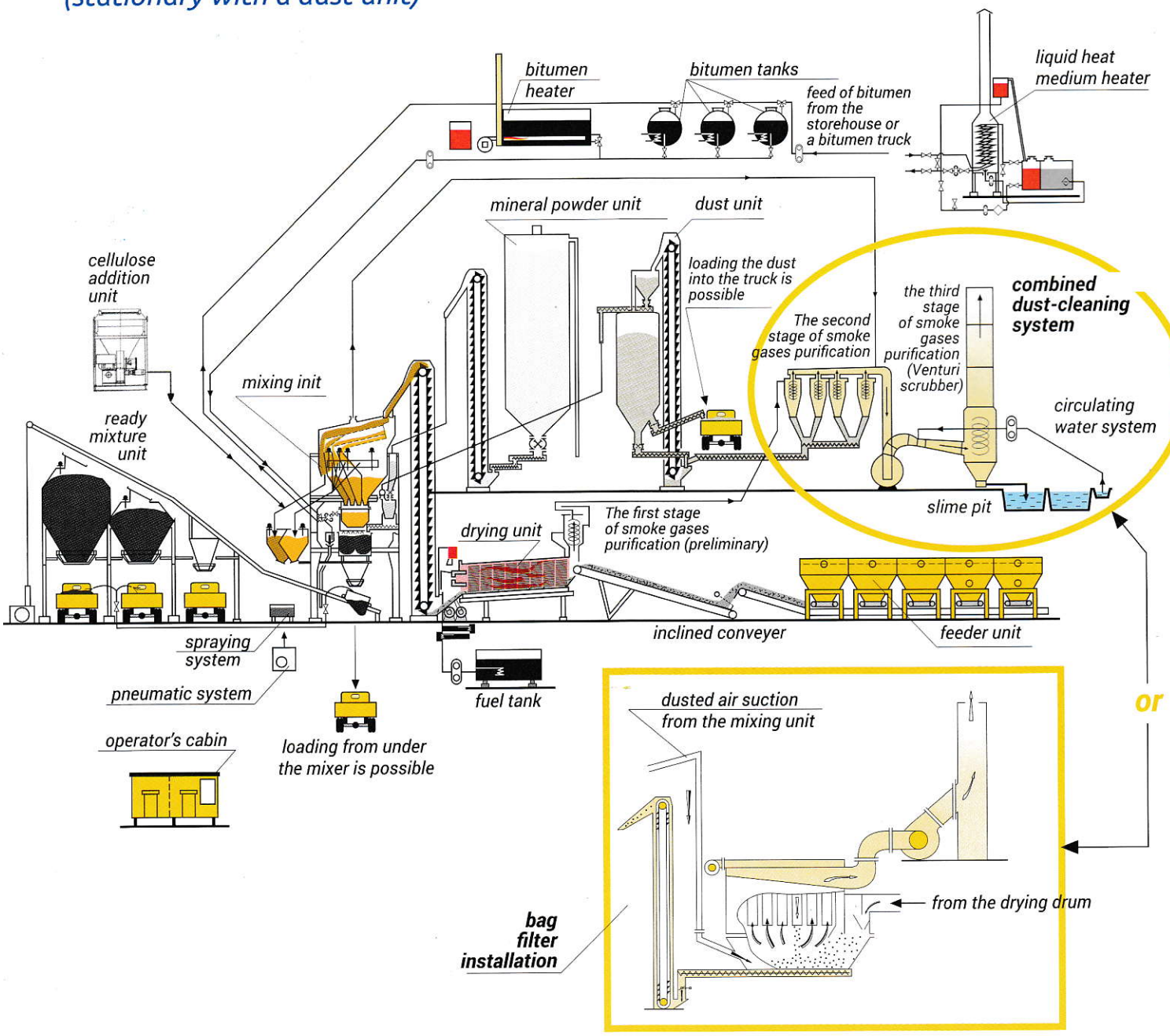
Asphalt mixing plants of the capacity of 160 tons/h DS-168

High-capacity asphalt mixing plants have given a good account of themselves among road-builders.

A distinctive feature of DS-168 plants consists in optimum price/quality ratio as well as relation of expenditure per ton of manufactured mixture. A wide variety of sets makes it possible to provide an individual approach to every customer choosing a plant. Asphalt mixing plants DS-168 are manufactured as stationary and relocatable models, ground-type and tower-type, with combined dust cleaning system and bag filters with a system of bitumen mild heating and ready mixture storage provided by the design.

Process flow diagram of asphalt mixing plant DS-168

(stationary with a dust unit)



Design of asphalt mixing plant DS-168 allows carrying out the following technological process operations:

- preliminary batching of wet rock materials in the feeder unit;
- drying and heating rock materials up to the operating temperature in the drying drum and their feed to the screen of the mixing unit;
- sorting heated rock materials by fractions, batching and their delivery to the mixer;
- three-stage de-dusting the smoke gases going out of the drying drum in the preliminary cleaning system, cyclones of dry de-dusting and in a wet dust catcher-scrubber "Venturi" (efficiency of dust catching makes 99.7-99.85% depending on the type of applied materials) or cleaning in bag filters (in this case dust emissions do not exceed 20mg/m3, which is 7 times as efficient as the combined de-dusting system);
- use of the caught dust by its delivery to the dust compartment of the mixer unit bin or to the dust unit bin;
- acceptance of mineral powder from cement trucks, its batching and delivery into the mixer;
- acceptance of bitumen from bitumen truck (or bitumen storehouse), its temporary storage and heating in bitumen tanks up to the operating temperature, batching and feed to the mixer;
- mixture delivery to the dump-truck or its feed by a skip hoist to the ready mixture bin.

Tower-type asphalt mixing plant DS-168637, the city of Belgorod.

Ground-type asphalt mixing plant DS-168637, the city of Baku.

Specification of series-produced asphalt mixing plants

Specification	DS-185	DS-185U	KDM 201	DS-168	DS-185M	DS-185UM	KDM 201M	DS-168M
Mobility	**stationary**				**relocatable**			
Nominal capacity at the humidity of initial materials (sand and broken stone) up to 3%, tons/h	56	64	110	160	56	64	110	160
Installed power, kW, maximum	199	200	330	420	199	200	360	450
Capacity of feeder unit bins, pcs. x m^3	4x8=32	4x8=32	5x8=40	5x16=80	4x8=32	4x8=32	4x8=32	5x16=80
Feeders type	belt-type, adjustable							
Control range of feeders speed	1:20							
Width of the conveyers belt, mm	500	500	500	650	500	500	500	650
Drying drum, 0 x C, mm	1400 x 5600	1460 x 6000	1800 x 7900	2200 x 8400	1400 x 5600	1460 x 6000	1800 x 7900	2200 x 8400
Drying drum drive	adjustable, with smooth start-up and speed change							
Fuel type	at choice: liquid or gaseous							
Number of fractions of batched rock material, pcs.	4-5							
Capacity of hot rock materials bin, m^3	8.3	8.3	19	19	8.3	8.3	19	19
Maximum mass of a batch, kg	730	800	1500	2200	730	800	1500	2200
Mixer type	batch-type							
Time for preparing one batch, sec.				45.	.60			
Total capacity of ready mixture unit bins, t (m3)	72 (39)	72 (39)	72 (39)	100 (55.6)	72 (39)	72 (39)	72 (39)	100 (55.6)
Way of loading ready mixture into a vehicle	from the mixer or ready mixture unit							
Availability of infrared pyrometrical sensor of asphalt temperature control	-	available			-	available		
Total capacity of mineral powder unit bins, m^3	23	23	32.5	60	23	23	32.5	60
Total capacity of dust unit bin, m^3	-	7	26	26	-	7	26	26
Total capacity of bitumen tanks, m^3	30	30	90	120	30	30	60	60
Type of dust catching device	at choice: bag filters or combined: dry (cyclones), wet (Venturi scrubber)							
Batchers type	weighing on strain gauges							
Control system	microintegrated							
Actuating mechanisms drive	electropneumatic							
Overall dimensions of the asphalt mixing plant (LxBxH), m	36.6x 30.2x 17.6	34.5x 23.8x 17.6	40.6x 41.Ox 18.05	53.2x 43.2x 18.3	34.5x 32.3x 17.55	34.5x 25.9x 17.6	39.1x 34.Ox 18.2	48.Ox 43.2x 19.2

Tower-type asphalt mixing plants

All the plants manufactured by PJSC "Kredmash" can be made as tower-type models with the storage bin under the mixer, which makes it possible to reduce the area of the mounting pad by 25% and compactly locate the equipment.

The ready mixture bin is located under the mixer and is divided into four compartments. Two compartments are meant for storage of ready mixture, one compartment – for direct discharge of asphalt and the other compartment – for exceeses and oversize. There are upper level indicators in each compartment. The whole block is heat-insulated.

Asphalt mixing plant DS-168

Asphalt mixing plant KDM 201637

Asphalt mixing plant DS-185

Specification	DS-185 (tower-type)	KDM201 (tower-type)	DS-168 (tower-type)
Total capacity of three asphalt bins, tons	32	65	65
Number of compartments in the bin	4	4	4
Number of upper level indicators in the ready mixture bin бункере готовой смеси	4	4	4
Overall dimensions of asphalt mixing plant (LxBxH), m	22.95x 23.15x 19.50	41.25x 37.15x 22.56	42.77x 40.45x 22.55

Soil mixing plant DS 50B and its modifications.

Soil mixing plant DS 50B with the mixer of continuous operation and its modifications (can be delivered as a stationary or movable fast-mountable version). The plant is used for preparing road-building cement-soil and bitumen-soil mixtures from loose soil at roadside quarries. The plant equipment provides continuous manufacture of high-quality cement-soil, bitumen-soil and cement-macadam mixtures.

The design of the soil mixing plant makes it possible to perform the following technological process operations:

- batching of soil, cleared from big (more than 100 mm) rock enclosures according to the assigned formula of the mixture and feeding it to the mixer;
- batching and delivery of cement and other dry binding materials to the mixer from service bunker filled from cement trucks via pneumatic transport;
- batching and delivery of liquid binding materials (bitumen) or water from the intermediate tank into the mixer;
- mixing all the components of the mixture and feeding the ready mixture into the bin;
- dispatch of the ready mixture from the bin into a vehicle.

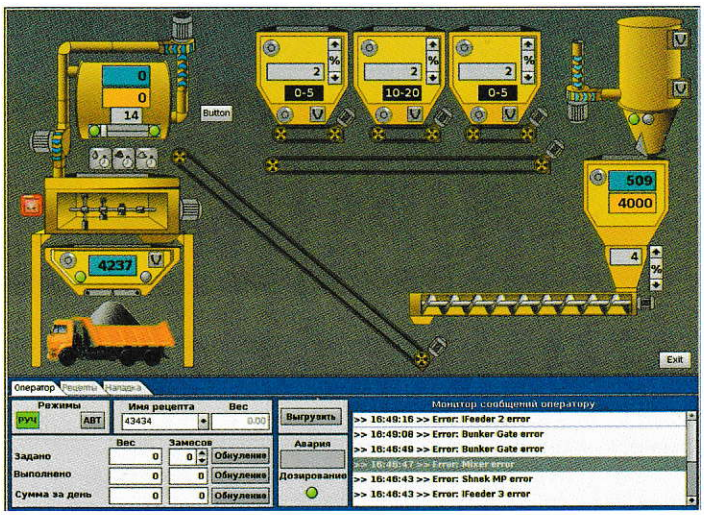
A centralized control of the plant is performed by an operator from the control panel located in a separate cabin equipped with AC (split-system).

Modular design of the plant improves its manufacture readiness, which considerably reduces the mounting and dismantling times during transportation from one construction site to another. New generation soil mixing plant DS 50B with MIS (capacity of 240 tons/h, with a microintegrated system) batches powder materials and water by weight not by volume. The design includes continuous-operation batchers and a flow meter; the whole process of mixture preparation is shown in the display screen.

Soil mixing plant DS 50B

Advantages of plants DS 50B with MIS and DS 50BM with MIS:

- continuous cement or another material weight batching (batching error ±1%);
- water batching via fluid meter (batching error ±0,5%);
- proportional feed of inert materials by feeders with variable-frequency drives;
- plant control is performed by a full-function microintegrated system with provision of an automatic operation mode, presence of technological and logical blockings, formulas basis and statistics of the plant operation.



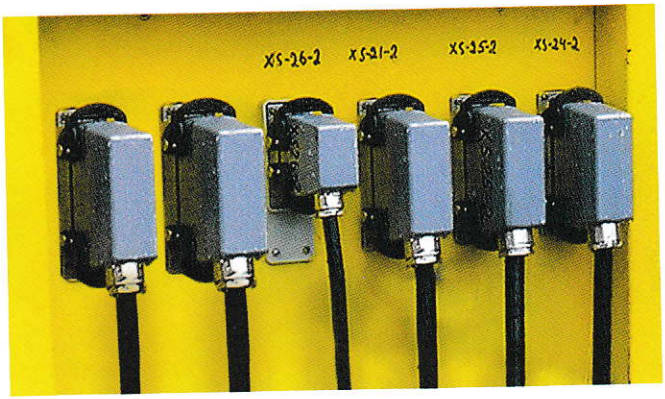
DS 50B MIS technological screen with an operator's panel.

Specification	DS 50B	DS 50БМ	DS 50B with MIS	DS 50BM with MIS
Mobility	stationary	relocatable	stationary	relocatable
Average technical capacity, tons/h	200-240			
Capacity of feed unit bin, m^3	3x16=48			
Capacity of mineral materials unit bin, m^3	23			
Capacity of ready mixture bin, m^3	5			
Capacity of the tank for liquid binding materials or water, m^3	14			
Availability of bed plates	-	+	-	+
Control system	relay contact	relay contact	MIS with additional weighing system	MIS with additional weighing system

Soil mixing plant DS 50B

Relocatable fast-mountable plants

Along with stationary plants PJSC "Kredmash" produces fast-mountable relocatable plants of the capacity of 56, 64, 110 and 160 tons/h. Their design does not require concrete foundation for assembling. These plants can be mounted and started within 10-15 days. Fast-mountable plants have all the advantages of the stationary ones: the same productivity, capacity of bins for ready asphalt-concrete mixture, store of hot rock materials, mineral powder, fuel, the same access for maintenance, repair, etc.



Fast-mountable plug-and-sockets

Reduction of assembling and dismantling time is provided by improved mounting readiness due to the block (module) assembly of the structures, enlargement of the units and decrease of the number of bolted joints; installation and test of the performance of the component parts under the manufacturer's conditions; producing electric connections in the form of fast-mountable plug-and-sockets; test assembly of plant blocks and units and their adjustment under the manufacturer's conditions; application of joints allowing units fast assembly and dismantling. Plant units are adapted for long-distance transportation by motor transport and trailers with low platform or via railroad. The plants contain additional subframes

Asphalt mixing plant DS-185U

(used for macadam storage after the assembly) providing both low site specific load and resistance to wind load.

After dismantling and moving of the plant the assembly site is recultivated. Thus, ecological safety is guaranteed and damage to the environment is minimized. All the above mentioned plants can be produced as tower-type models (with the ready mixture bin located under the mixer).

Components/basic parts of asphalt mixing plants

Feeder unit

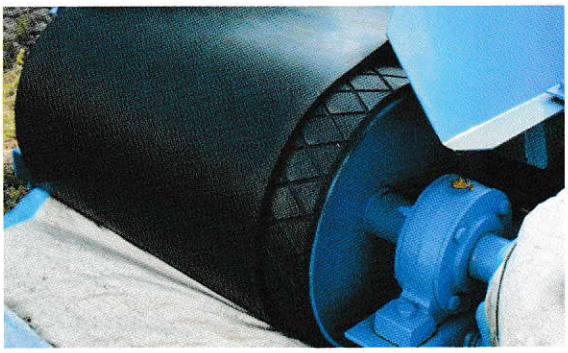
The feeder unit consists of blocks with installed belt feeders and a conveyer. It is intended for preliminary batching initial materials (macadam, sand) in accordance with the assigned formula and feeding them to the inclined belt conveyer. Initial inert materials (macadam and sand) are delivered into tanks equipped with a vibratory feeder and a sieve to catch oversized fractions. Vibrators located on the sieves and side wals of the tanks prevent materials from getting stuck. The conveyer is equipped with a safety system. Tanks are made with the capacity of 8 m^3, 12 m^3 (in the automombile overall dimension) or 16 m^3. Switching to a different asphalt formula can be made without shutting down the plant. Application of frequency converters allows remote change of the belt feeders productivity from the operator's cabin. In this case the productivity of belt feeders is adjusted automatically. The feeder unit of plants DS 185 KDM 201, DS 168 can be additionally completed with a block with the width of material loading equal to 3.5 m, on request.

Feeder unit

Inclined conveyer

An inclined belt conveyer is intended for transportation of rock materials from the feeder unit to the drying drum. The conveyer movable operating element consists of a belt stretched on the drive pulley set into motion via a reductor by an electric motor. For the case of sticking the material to the conveyer belt the cleaners are provided both inside and outside. The conveyer is equipped with safety system elements.

Inclined conveyer



Dryer unit

Is intended for heating and drying rock materials up to the state required for preparation of the mixture as well as for eliminating dust particles in the exhaust gases.

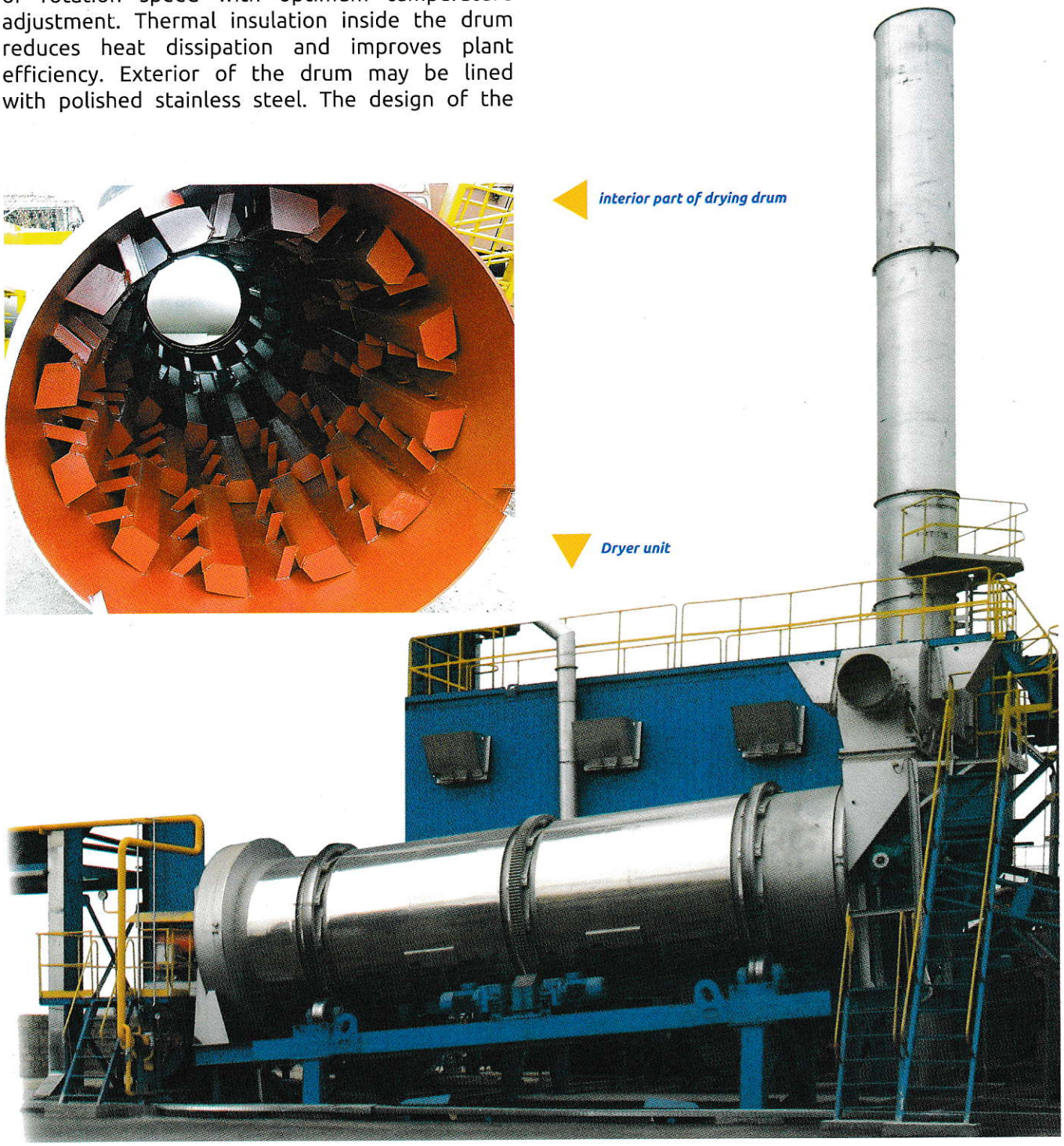
The dryer unit includes:

- a drying drum with a furnace unit;
- a dust filtering system (gas-purifying equipment).

The use of frequency converter in the drying drum control allows its smooth start and regulation of rotation speed with optimum temperature adjustment. Thermal insulation inside the drum reduces heat dissipation and improves plant efficiency. Exterior of the drum may be lined with polished stainless steel. The design of the interior part provides efficint heat of the materials and minimum fuel consumption. A possibility of processing wet materials is provided. Optionally, the plant can operate on natural gas or liquid fuel (residual fuel oil or diesel fuel oil). Full combustion of heavy oil fuel (black oil M100) is achieved by thorough heating of the oil inside the tank and fast heater, use of a high-capacity smoke exhaust, modern burners and automatic temperature/ rarefication level adjustment inside the furnace. Switching between the fuel types can be done in short time.

interior part of drying drum

Dryer unit



Furnace unit

Furnace unit is intended for burning fuel to achieve high-temperature gas medium in the drying drum. The burner is controlled according to the output parameters – the temperature of rock materials and exhaust gases. Temperature in the drying drum is regulated remotely from the control panel in the operator's cabin through the change of thermal productivity.

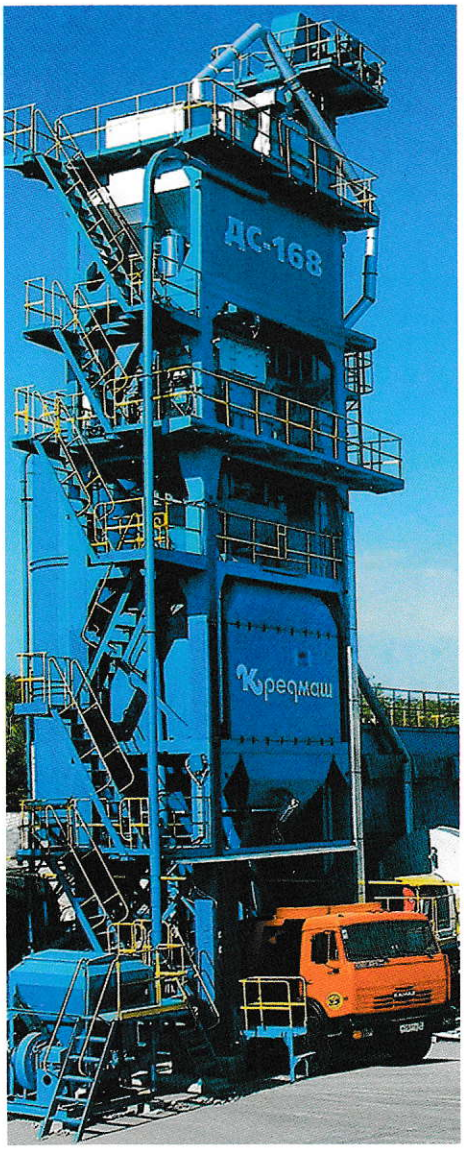
Mixer unit

Is used for sorting, storing and batching of heated sand and macadam, batching of bitumen, mineral powder and dust, preparing asphalt-concrete mixture and its dispatch directly into trucks or into the ready mixture unit skip.

The mixer unit consists of:

- elevators,
- screen block,
- upper, middle and bottom blocks,
- a bin for surplus and oversized material.

The hot bin is equipped with sensors of high/low levels of rock materials, mineral powder and dust. Temperature control sensors are installed in rock material compartments and before the bitumen batcher. Optionally, the mixer unit can operate bypassing the screen. All asphalt mixing plants are equipped with CAMOZZI pneumatics, which made it possible to improve the reliability of the plant operation.



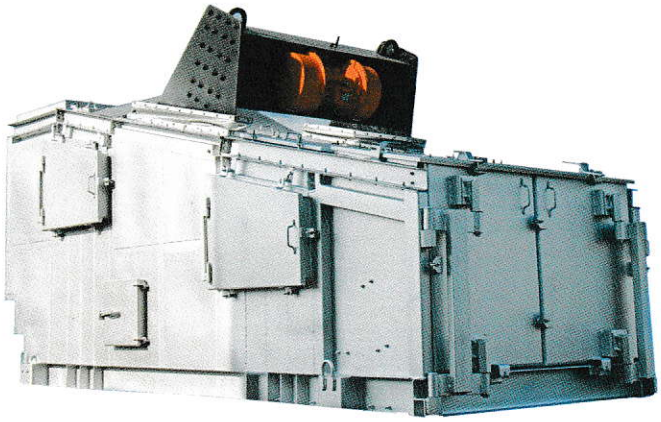
Screen

A vibration screen of a self-balance type is used in the design of manufactured asphalt mixing plants of the capacity of 110 (KDM 201) and 160 tons/h (DS 168).

The screen design is based on the following:

- new engineering solutions of design departments of PJSC "Kredmash" ;
- "OLI" motors-vibrators (Italy);
- "WÜRTH" products (Germany);
- high-strength grades of steel for the basic structures of the screen.

All this will allow increase of the operation resource of the new screen and the asphalt mixing plant on the whole.



Mineral powder unit [1]

Is intended for acceptance, temporary storage and dispatch of mineral powder into the batcher or intake of the mineral powder elevator in the mixer unit. Bins are available in volumes of 23m³; 32.5m³ and 60m³.

Dust unit [2]

Intended for collecting dust caught by the dust filters and feeding it via elevator to the mixing unit for batching. If necessary, dust can be dispatched via loading auger into tracks.

Mineral powder and dust bins are equipped with high and low level sensors.

Aeration system at the bottom of each bin prevents loose material from choking-up.

The reservoirs can be completed with continuous sensors or a third middle-level sensor.

Cellulose addition unit

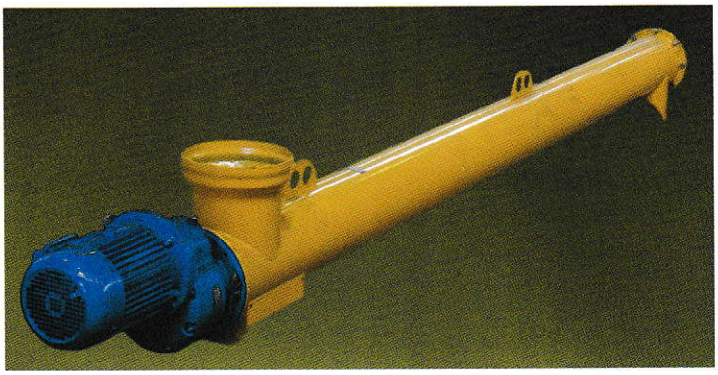
Cellulose addition unit design provides acceptance, batching and dispatch of granulated cellulose additives of VIATOP, GENICEL type and the like into the asphalt mixing plant mixer with the apparent density of 500±50 kg/m^3.

The unit includes all the necessary equipment providing the possibility to outfit the asphalt mixing plant quickly (within 1-2 days) and start production of macadam-mastic mixtures.

Specification	
Receiving bin capacity, m^3, minimum	1.5
Weighing limits, kg	1 -12
Batching accuracy, %	±1
Installed power of electric motors, kW	11.2

Loading augers for loose materials

Augers are intended for transportation and feeding loose materials: dust, mineral powder, cellulose additions, polymers into batchers or elevators. Augers of domestic production and those made in Italy are used.



Dust cleaning system

Gas-cleaning equipment is provided for protection of the environment against pollution in the process of asphalt mixing plants operation. Optionally, a bag filter or a combined three-stage dust catching system can be installed.

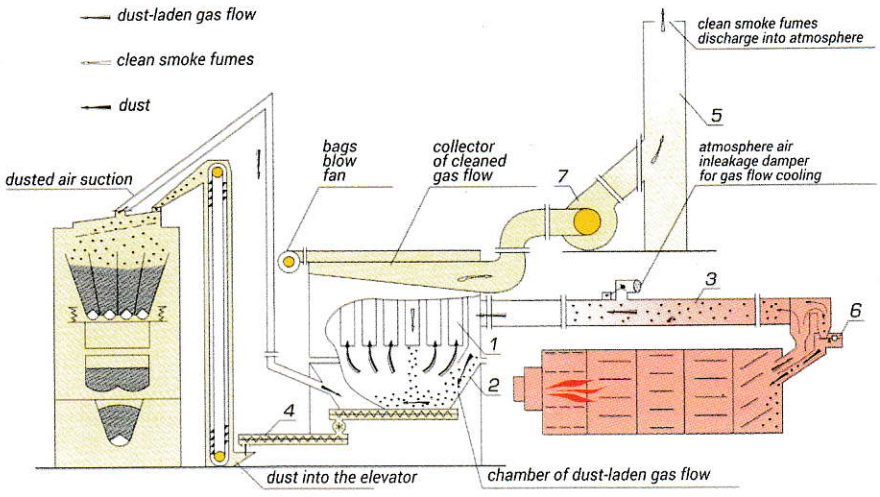
Installation of a bag filter

A bag filter installation includes:

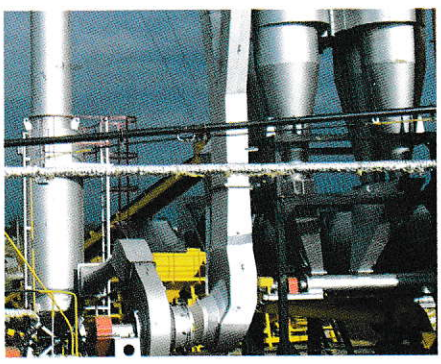
1. filter block (with thermal insulation);
2. bin block (with thermal insulation);
3. system of gas flues connecting the bag filter with the drying drum, the smoke exhaust and the chimney;
4. auger for transportation of the collected dust to the elevator;
5. chimney;
6. smoke exhaust:
   - electric equipment (control system);
   - supports, platforms, stairs, railings, pneumatic system.

Specification of bag filter units of the capacity of:	56 tons/h	64 tons/h	110 tons/ч	160 tons/h
Capacity by filtered gas, m^3/h	16 500	19 000	32 000	45 000
The area of filtered surface, m^2	245	257	425	510
Number of compartments, pcs.	6	7	11	13
Filtering elements, pcs.	120	140	220	260
Bags material	«Nomex» NO/NO 501 (Germany)			
Temperature of filtered gas, °C	up to 180			
Maximum allowed short-term temperature, °C	up to 220			
Allowed concentration of dust in the filtered gas: • at input, g/m3, maximum • at output, mg/m3, maximum	 250 20			

Process flow diagram of bag filter unit



Combined dust cleaning system



Gas filtering equipment of the dust catching system consists of:

- preliminary cleaning stage consisting of a direct-flow cyclone- dust catcher intended for catching large dust fractions, dust catching efficiency is 35-45%.
- the second stage of cleaning (cyclones block), dust catching efficiency is 92-98%.
- the third stage of cleaning (wet gas filtering). The third stage includes a "Venturi" scrubber, a drop catcher and a water-supply system. Dust catching efficiency is 98%.

Ready mixture unit

Is used for accumulation, temporary storage and dispatch of prepared asphalt mixture into vehicles.

Asphalt temperature remains constant for a long time due to the thermal insulation of the bins. Indicators of the upper level and temperature control sensors are installed in the bins. Bins walls and valves are heated by means of electric heaters. Skip hoist of the unit is designed to smoothly start and stop.

The ready mixture unit includes:

- storage bin;
- holding bin for dumping ill-conditioned materials;
- platform;
- skip;
- winch;
- skip emergency stop system.

Specification of ready mixture bin	DS185	KDM 201	DS168
Total capacity, tons	72	72	100
Number of bins	1	1	2

Bitumen equipment

The bitumen heater is intended for heating the bitumen and heat material up to the operating temperature and feeding it to the mixing unit batcher. It consists of a tank of the capacity of 30m³ or 60m³, a furnace unit, a fuel tank, electric equipment.

Specification	
Bitumen heater: tanks capacity, m³	30 or 60
ways of bitumen heating:	1. flame-type 2. with thermal oil circulating along the tank coils
used fuel	at choice: liquid or gaseous
Tank (bitumen): tank capacity, m³	30 or 60
ways of heating:	1. with thermal oil circulating along the tank coils 2. electric heating

Microintegrated system

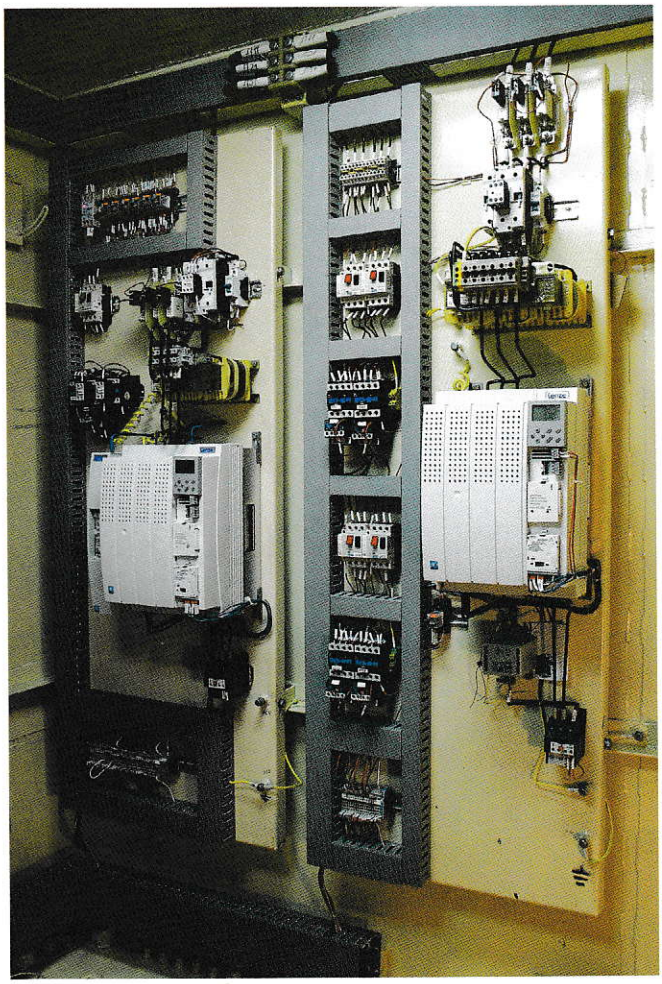
PJSC "Kredmash" asphalt mixing plants are equipped with a new generation microintegrated system based on new technologies of control of elaborate technological complexes and making the process of asphalt preparation completely automatic.

MIS application provides optimum, economic mode of plant operation and changes significantly the role of the operator in its control.

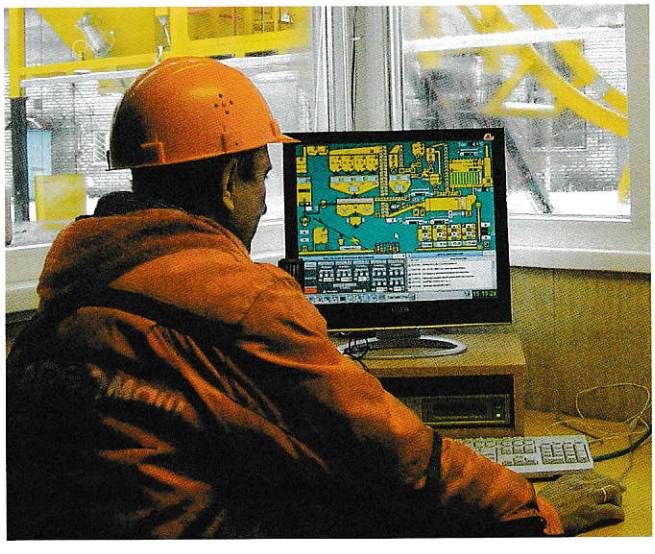
MIS advantages:

Due to MIS merits, the influence of human factor is reduced to the minimum, overhaul idle time is shorter, high quality of asphalt is provided during the whole period of the plant operation. All the stages of technological process are reflected on the technological screen of the monitor and provide the operator with all the required information. Availability of remote monitoring enables distant monitoring of the system; it even allows software changing and giving recommendations as to optimization of the plant operation. MIS is used in both production plants and modernized asphalt mixing plants manufactured in previous years.

- Complete control of all the plant mechanisms.
- Availability of blockings, providing accident-free operation.
- Automatic operation mode of all the plants sections.
- Advanced weighing system providing high accuracy of fractions batching.
- Application of industrial modules and complete galvanic separation of signals provides high reliability of the control system.
- Quick switch to manufacturing the mixture according to previously assigned formulas.
- Complete account of the manufactured asphalt and material consumption with the possibility of viewing and printing the results.
- Continuous control of the state of the plant mechanisms and basic technical variables.
- Automatic start of the asphalt mixing plant with automatic ignition and rock materials feed when the temperature of exhaust gases reaches the assigned value.
- Use of "preact" by means of assessment of material batching speed.
- Preliminary batching at feeders with principal capacity regulation according to the formula.



Control cabinet

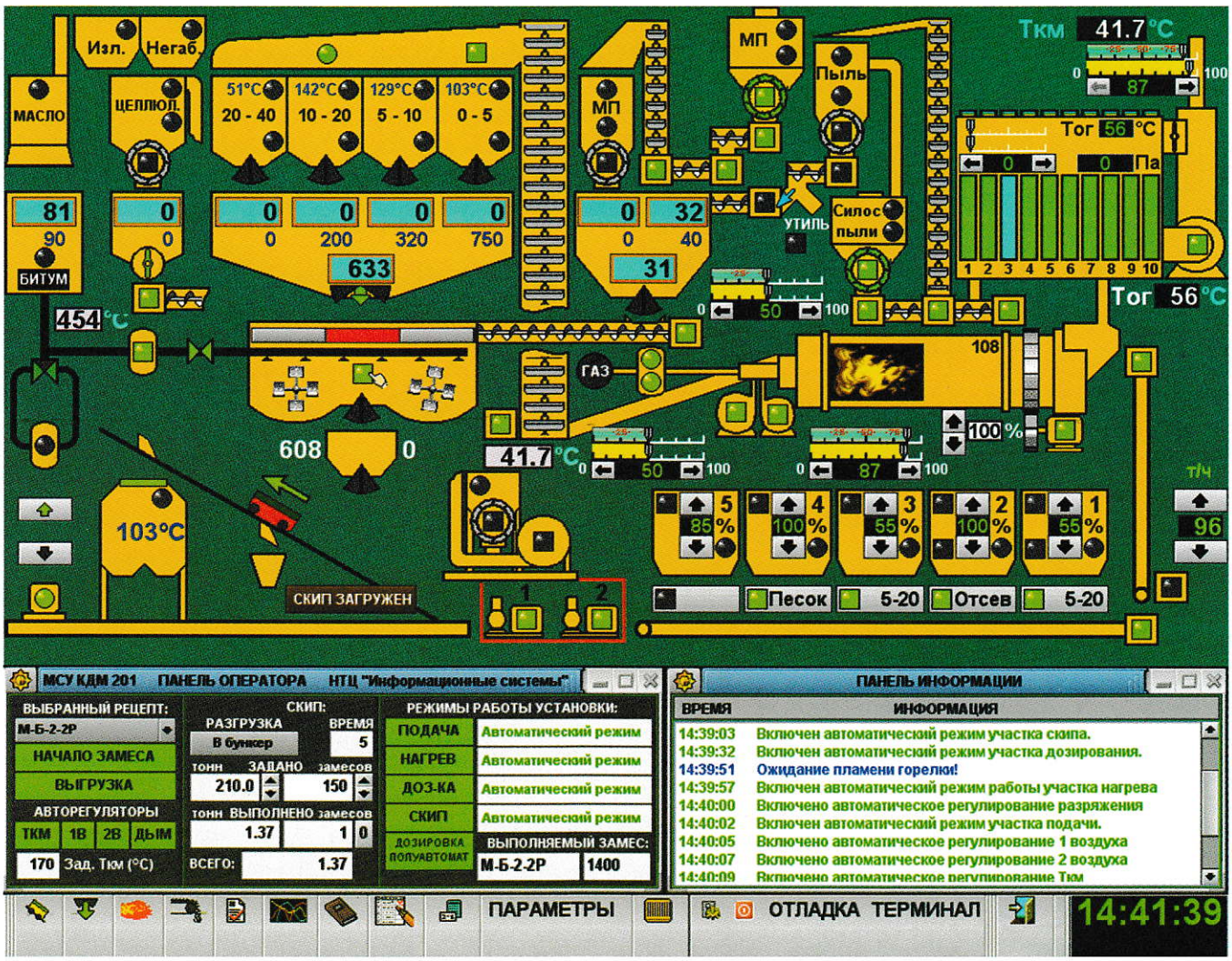


Control board

- Keeping formulas archives.
- Control of temperature of rock materials and exhaust gases in the drying drum, asphalt in the ready mixture bin, bitumen in reservoirs and bitumen pipes before the batcher.
- Providing the operator with informational, warning and emergency messages.
- Possibility of measuring temperature of the ready asphalt in the skip trolley or truck body by means of pyrometric sensor.
- Possibility of completing the control system with material level analog sensors.
- Possibility of integration of the control system into the accounting system of the enterprise on the basis of 1C-book-keeping.
- The control system can be completed with a system of remote statistics with the possibility of data communications through the network.
- For operation convenience 4- or 8-camera video surveillance systems are installed.

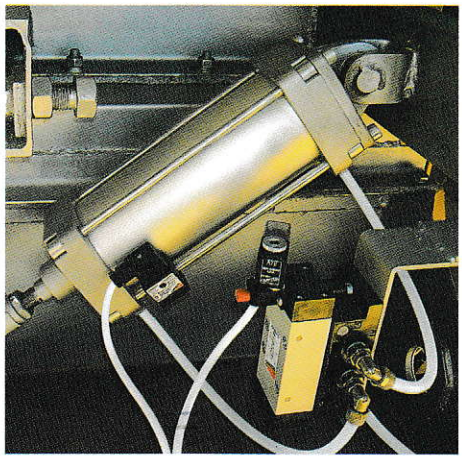
Cabin of operator

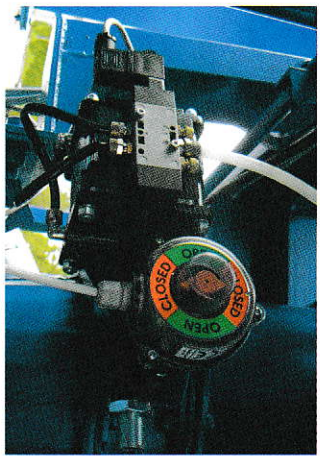
Interface of microintegrated system



Pneumatic system

Is intended for supply of compressed air into the pneumatic cylinders of the plant units. The pneumatic system includes a compressor unit, pneumatic distributors, manometers, bags, air ducts. To assemble the pneumatic system it is necessary to use suitable fittings produced by PJSC "Kredmash". Information as to availability of a certain type of fittings can be obtained from the specialists of the enterprise.





Operator's cabin

Operator's cabin is the working place of the specialist performing control of the asphalt mixing plant. The control block is divided into two zones: operator's cabin and electric equipment room. A control panel, a control cabinet and devices are located in the operator's cabin. Start-up and protection instrumentation is located in the electric equipment room. For cooling, heating and ventilation of the air, creation of comfortable climatic conditions the cabin and the electric equipment room are equipped with air conditioning.

Bitumen modification unit

Bitumen mixing tank KDM 221 is used for preparation of modified bitumen with solid dispersed, powder and liquid additives, as a part of asphalt mixing and bitumen plants. Tanks of the capacity of 20 m^3 with one mixing device and of the capacity of 30 m^3 with two mixing devices are produced.

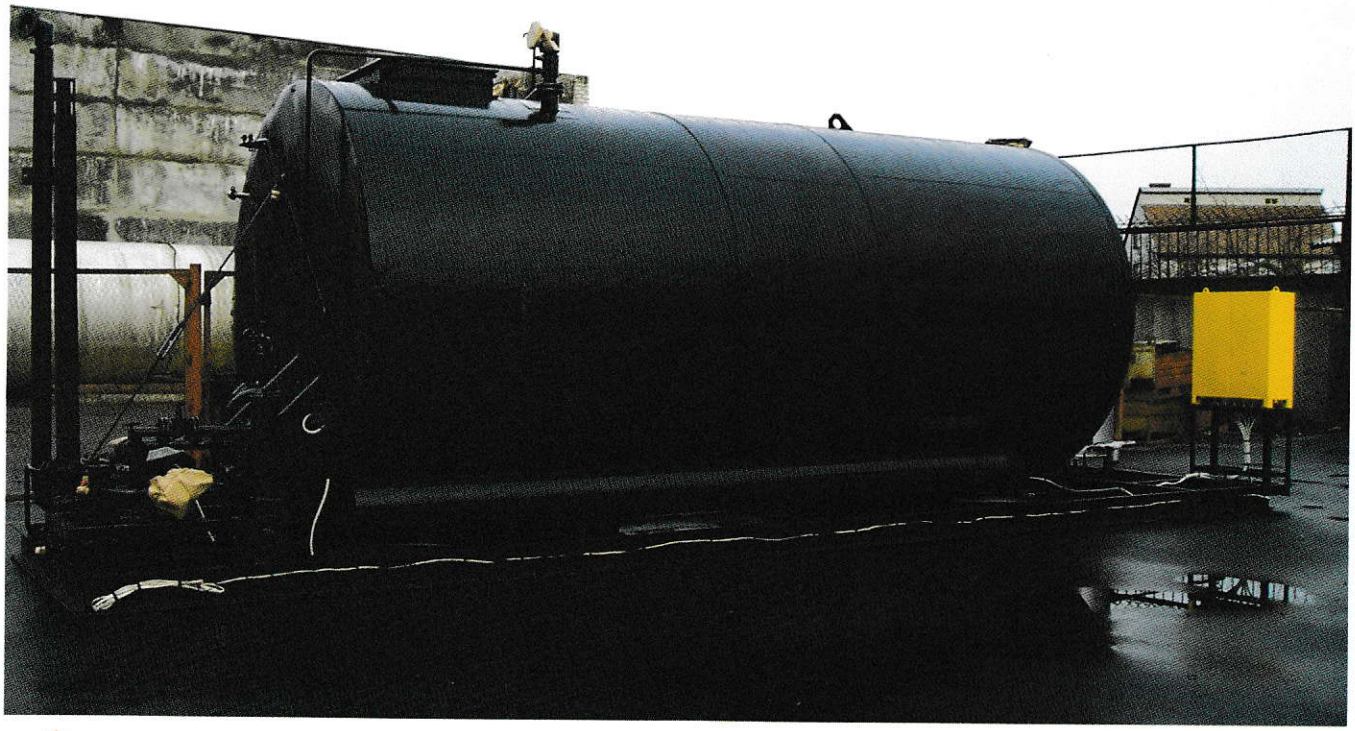
It can also be used for:

- softening of bitumen by lighter oil products or introduction of surface materials. In this case mixing process becomes dozens times faster compared with induced circulation.
- for tar and bitumen dehydration. Heating intensity can be increased nearly threefold and dehydration time can be made several times less without the danger of boiling up.

Total amount of modified bitumen prepared per a full cycle is 20-30 m^3.

Modernization of bitumen equipment for asphalt mixing plant

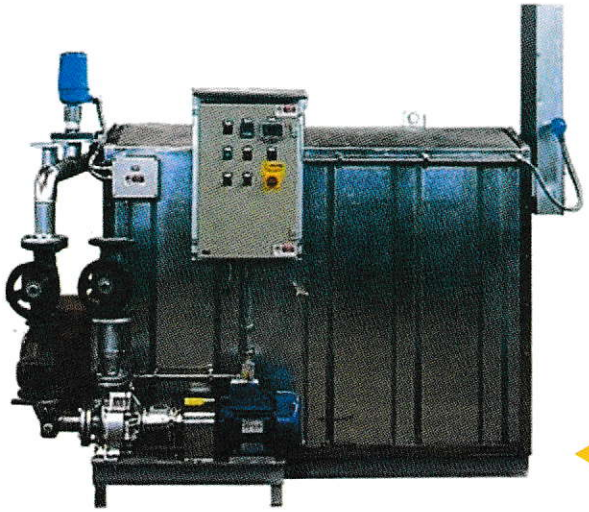
Aiming at reduction of operating costs of the consumers of PJSC "Kredmash" asphalt mixing plants the design bureau of the enterprise provided modernization of the asphalt mixing plant bitumen equipment. The basic concept of the design consisted in improvement of power efficiency due to "mild" bitumen heating with thermal oil in tanks with increased coils area, use of a flow heat exchanger providing rapid bitumen heating from 110° C up to the operating temperature during a cycle of preparation of asphalt-concrete mixture. As a result, the necessity for energy carrier expenditure for heating the whole volume of bitumen in the tank up to the operating temperature is eliminated. Besides, a profound automation has been performed, which makes it possible to control bitumen equipment from the main computer of the asphalt mixing plant control system and provides blockings eliminating damages of its components due to possible maloperations.



Bitumen tank 30m³

1. **Bitumen tank:**
   - Volume 30 m³
   - Coils are 55 m²
   - Oil volume 850 l
- Automatic regulation of bitumen temperature in the tank (system: a temperature controller – a cock with an electric servo drive of heat carrier feed).
- Indicators of bitumen level in the tank.
- Remote control of bitumen temperature in the tank from the operator's working place.
- Operator's control of cocks for bitumen withdrawal from the tanks.
- On customer request asphalt mixing plant can be equipped with a bitumen tank of 60 m³

bitumen tank of 60m³



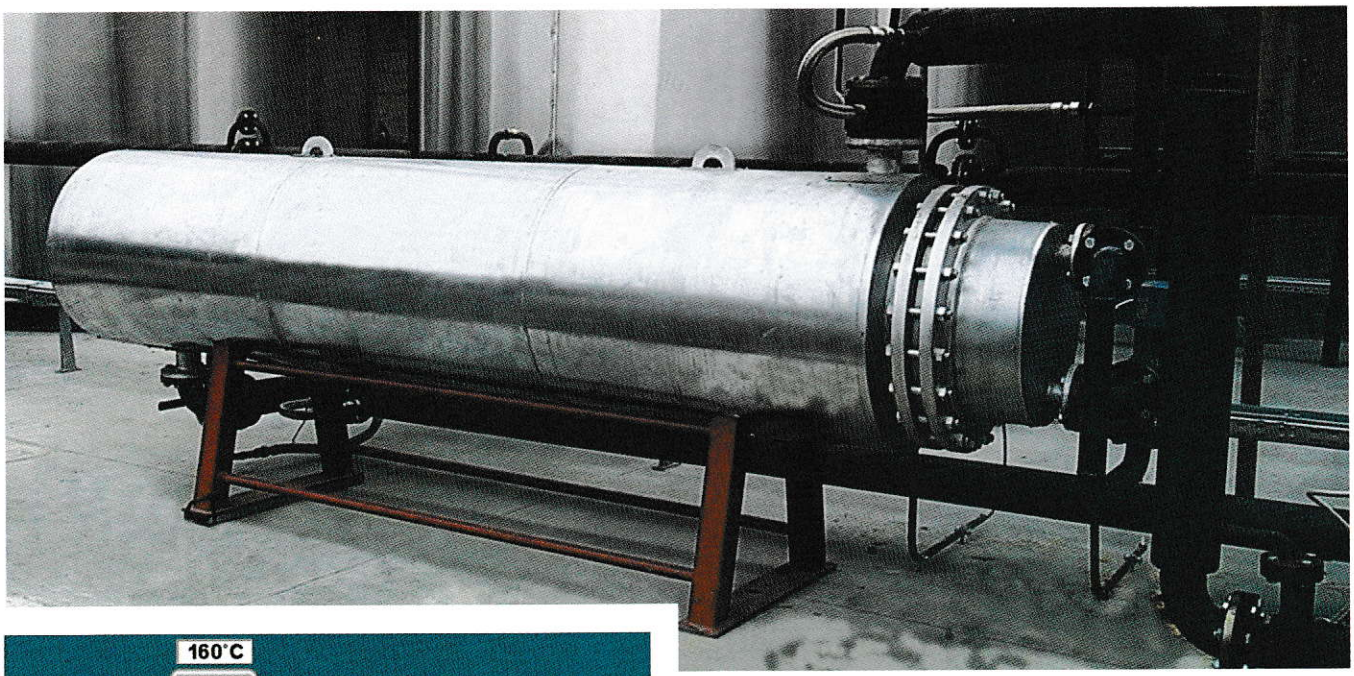
Heat-generator MG-30

2. Heat-generator MG-30 MASSENZA (Italy):

- Thermal power 300000 kcal/hour;
- Pump capacity 45000 l/hour.

3. Flow heat exchanger MASSENZA (Italy):

- Thermal power 300000 kcal/hour;
- Heat medium feed, minimum 45000 l/hour;
- Electric servo drive for control of heat medium feed through the flow heat exchanger.



Flow heat exchanger

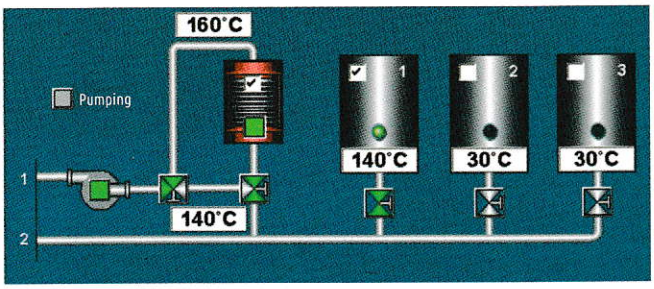


Diagram flow heat exchanger

4. Bitumen pipes:

- Bitumen receiving center, capacity 25000 l/hour;
- Bitumen feed center, capacity 25000 l/hour;
- Bitumen communications and stop valve.

5. Oil pipes:

- Oil reservoir, volume 2.65 m3;
- Filling-in pumping unit 500 l/hour;
- Cocks for feeding heat medium into the reservoir with electric servo drive BRAY (Germany).
- Pipelines and stop valve.

6. Pneumatic system:

- Pneumatic drive CAMOZZI of cocks for bitumen withdrawal from the reservoirs, bitumen feed through the flow heat exchanger and bitumen batching.
- Interconnection of pneumatic channels (filter-moisture eliminator, pneumatic distributors, pipelines).

7. Electric equipment:

- Control cabinet (temperature controllers, switchgear, control elements).
- Interconnection of cable-wire products

Spare parts for asphalt mixing plants

PJSC "Kredmash" proposes a wide variety of spare parts for both new asphalt and soil mixing plants and for plants manufactured in previous years. Nomenclature of spare parts includes more than 800 names in stock at the enterprise and also in warehouses of regional representatives. The enterprise guarantees high quality of original spare parts and minimum delivery terms – from 3 to 20 days.

Assembly and start-adjusting of asphalt mixing plants

PJSC "Kredmash" offers service as to assembly and start-adjusting of asphalt mixing plants. Our specialists have wide experience in assembly and start-adjusting of asphalt mixing plants of different modifications. Asphalt mixing plant steady and faultless operation during many years depends on correct jointing the units, their adjustment and regulation. The list of assembling and adjusting services includes the following ones:

- foundations laying out;
- assembly of asphalt mixing plants of any modification;
- electrical mounting of the equipment;
- start-adjusting work with delivery of asphalt-concrete mixture;
- training personnel to operate an asphalt mixing plant at the Customer's site.

The term of assembly of asphalt mixing plants is from 20 to 35 calendar days (depending on the modification, productivity).

Training personnel

Qualified personnel is half the battle for successful operation. Practice shows that most of operation problems occur due to insufficient qualification of the operators and maintenance staff.

To solve the problem of training highly qualified specialists PJSC "Kredmash" teaches operators of asphalt mixing plants. With this purpose in view, specialized classes for training operators of asphalt mixing plants were created on the basis of the enterprise. Classes are held by both specialists-designers and specialists having wide experience of practical work at asphalt mixing plants. 100-hour training program provides a high level of theoretical and practical study.

Training is carried out at stands imitating operation of asphalt mixing plant in real time mode. After successful completion of the course a certificate of the state sample is given.

Modernization of asphalt mixing plants

Since 1949 PJSC "Kredmash" has manufactured more than 21 thousand asphalt mixing plants (AMP) of various capacities of more than 100 different modifications. Up-to-date AMPs meet all the consumers' requirements as to the technical level, the quality of manufactured mixtures and ecological parameters. Earlier manufactured AMPs become technically and morally obsolete. It is difficult to use them for production of asphalt mixtures meeting contemporary quality requirements. Besides, smoke gases filtering does not always meet ecological requirements. These plants use a lever system of weigh batching rock materials and mineral powder, a volume (with a float) bitumen batcher. Bubble-type wet gas purification unit used in these plants is not very efficient. Besides, many plants were not completed with a ready mixture unit and a mineral powder unit.

To bring AMPs manufactured in previous years to the up-to-date level a step-by-step modernization is proposed:

mixing unit modernization with substitution of a lever batching system for tensor-sensor weighing batchers, including change of volume bitumen batchers for weighing ones. If necessary, additional equipment with a mineral powder unit, substitution of the mixer drive for a more powerful one, change of the screen with the aim of sorting and batching materials into four and more fractions;

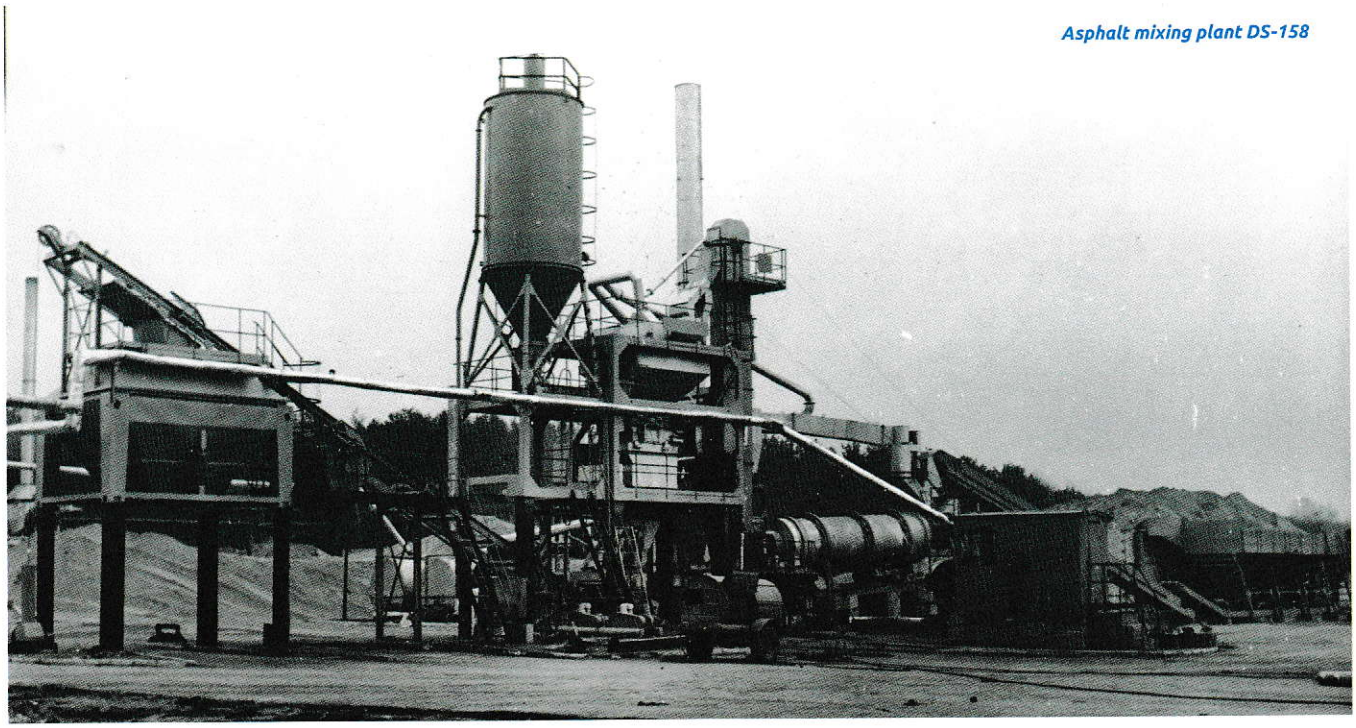
drying unit modernization includes substitution of the furnace unit for a new one, more economic and efficient. If necessary, transition from liquid types of fuel to natural gas is possible. With the aim of improvement of ecological variables it is recommended to change the old system of dust filtering with use of cyclones block to bag filter unit. The level of exhaust gases purification improves by more than 10 times, there is no necessity for wet system of dust filtering and wet sludge utilization, if necessary, a drying drum with thermal insulation can be supplied;

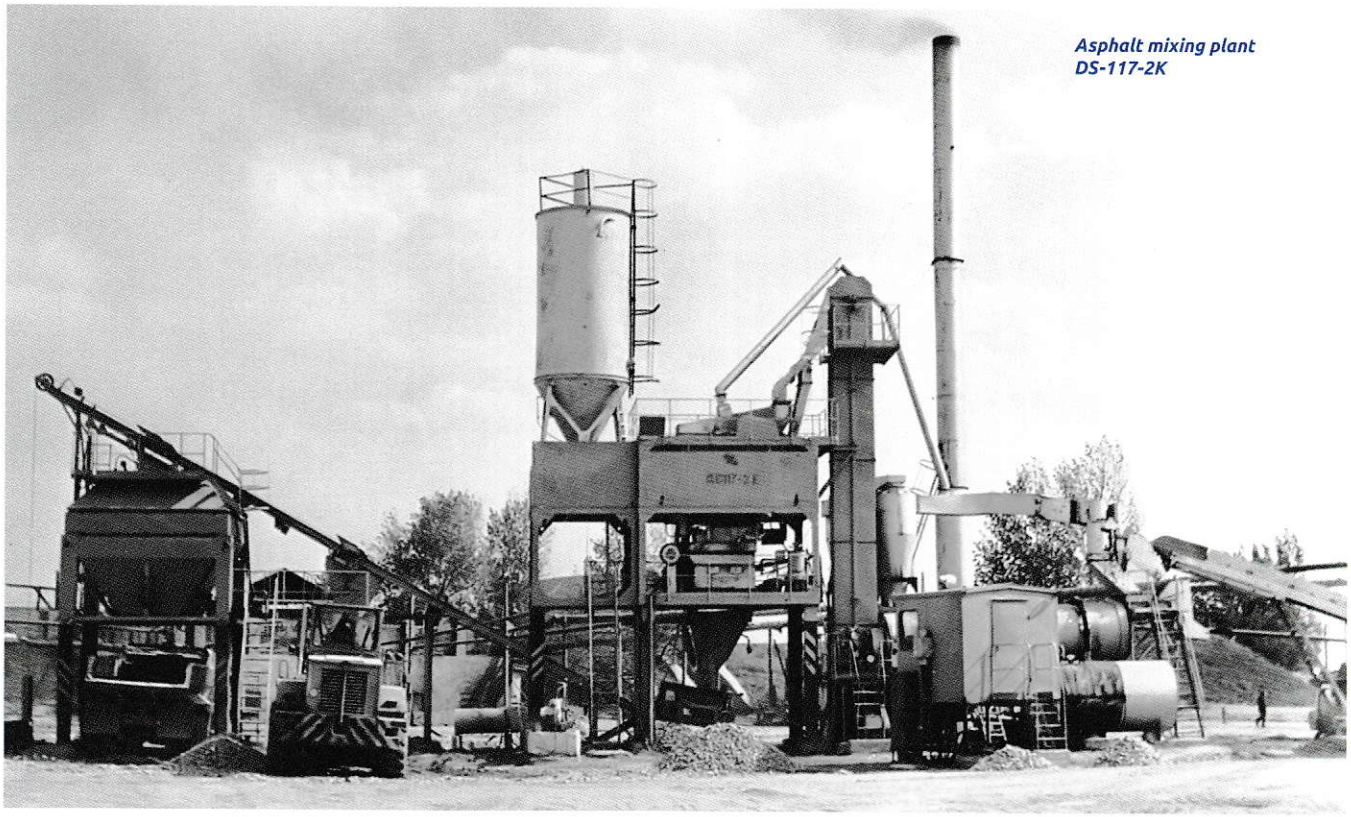
feeder unit modernization includes change of the old feeder unit for a new one with 4-5 bins with the width of loading up to 3.5 m with belt feeders and a possibility of regulation of their productivity from the operator's cabin by means of frequency converters;

ready mixture unit modernization includes installation of a thermal-insulated bin of the capacity from 70 to 100 tons and more, with frequency regulation of the skip motion speed;

bitumen section modernization implies installation of horizontal and vertical bitumen storage reservoirs of the volume of 30 and 60 m^3, bitumen heater of the volume of 30 and 60 m^3 with an automatic burner for operation on liquid fuel or natural gas. Optionally, it is possible to supply a bitumen heater with oil registers and a flow bitumen heater, a liquid heat medium heater of the power of 300000 kcal/hour with liquid or gas burner, pump bitumen units, bitumen pumps, straight-through bitumen cocks, three-way stopcocks, transmission oil stations, bitumen pipe sets;

Asphalt mixing plant DS-158





Asphalt mixing plant DS-117-2K

operator's cabin modernization is performed by substitution of a relay control system for an up-to-date microintegrated system with the use of components made by leading world manufacturers;

if necessary, it is possible to supply a **cellulose addition unit** to produce macadam-mastic asphalt-concretes (MMA), a unit for preparation of modified bitumen with a reservoir 30 m3 and two mixing devices.

All the supplied equipment is completed with technical documents and certificates. Work can be performed by highly qualified specialists of our enterprise. In any case your individual requirements will be taken into consideration during modernization.

You can find more detail about AMP manufactured in previous years at ***www.kredmash.com.***

Asphalt mixing plant DS-117-2E

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