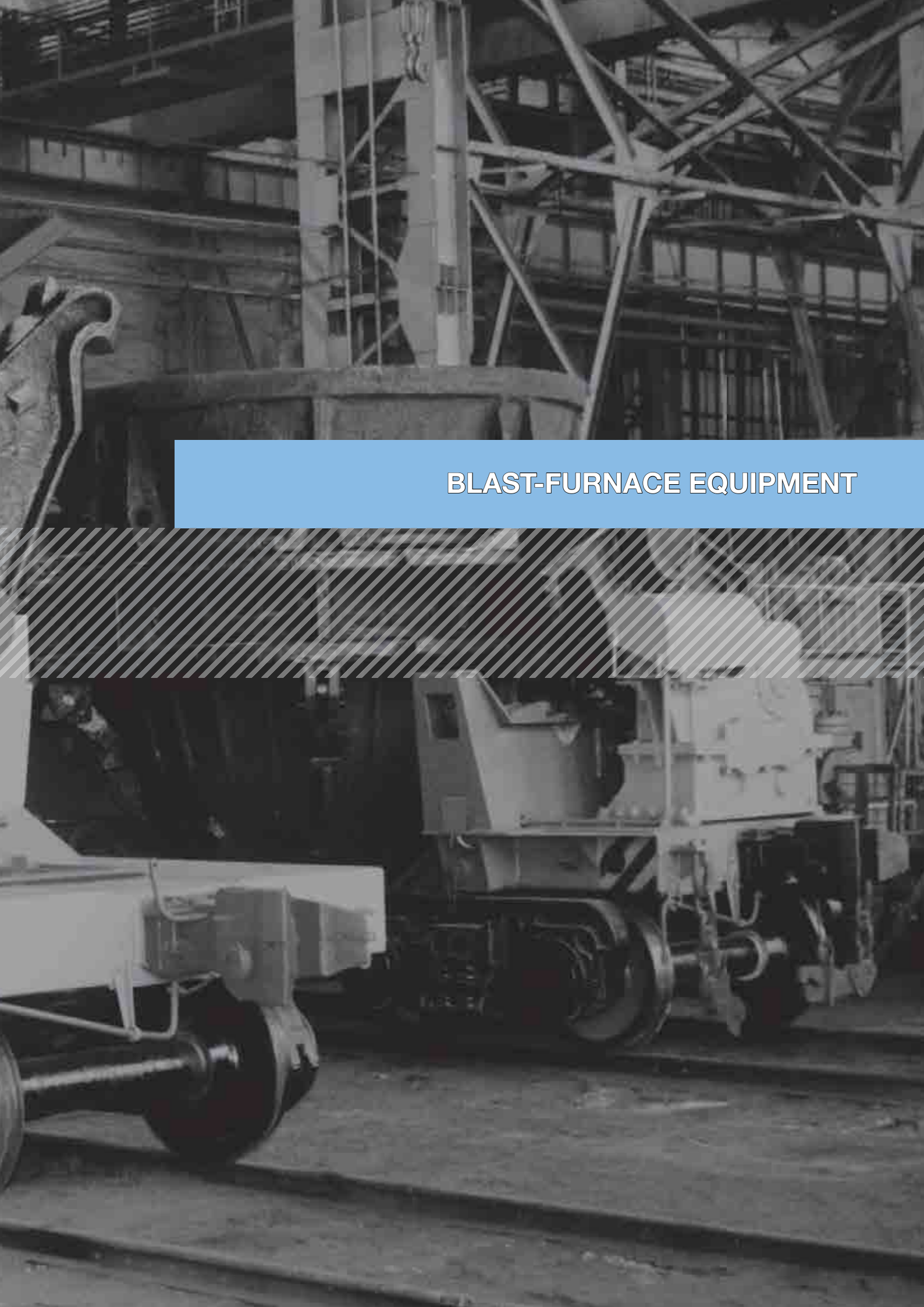


BLAST-FURNACE EQUIPMENT

HOT METAL LADLE CAR

Standard series: G-1-50, G-100, G-1-140.
Hot metal ladle car is designed for transportation of hot metal from furnace to casting machines, mixers and steelmaking units. The hot metal ladle cars with ladles of capacity of 50, 100 and 140 m^3 are produced.
Hot metal ladle car moves along the railways with the help of traction railway equipment. The ladle is tilted with a tilting winch or crane.

The hot metal ladle car consists of:
- bearing frame;
- railway carriages;
- ladle;
- automatic coupler.

The scope of supply of the hot metal ladle car does not include the ladle brickwork.

SPECIFICATIONS	VALUE		
Type	G-1-50	G-100	G-1-140
Track gauge, mm	1520	1520	1520
Number of loaded hot metal ladle cars moving in a formation	5	5	6
Carriage base, mm	1850	1300	1500
Overall dimensions, mm :			
- length (along the automatic coupler axes)	8200	8200	9000
- width	3140	3600	3750
- height (from the rail head to the upper ladle edge)	3500	4210	4300
Weight of empty hot metal ladle car without brickwork, kg	21090	36410	45000

Manufacturing period – 120 days

NON-SELF-PROPELLED RAILWAY SLAG CAR

Standard series: ShTD-11, ShTD-16, ShTD-16,5, ShTS-11, ShTS-16.
Non-self-propelled railway slag car with planetary ladle tilting gear is designed for transportation of molten or hard slag from the steelmaking units to granulating units or for dumping. The non-self-propelled railway slag car moves along the railways with traction railway vehicles. The ladles of slag cars may be filled with slag directly on the slag car or installed thereto when filled. The frame and automatic coupler are high-strength and allow to transport up to 15 slag cars in a formation. The slag cars with capacity of 11 and 16 m^3 are equipped with a round ladle of circular cross-section with a spherical bottom, and the slag cars with capacity of 16.5 m^3 – with a ladle of oval cross-section.
The traction slag cars with the ladles for blast-furnace slag (ShTD) and the ladles for steelmaking (ShTS) are produced).

The slag car consists of:
- bearing frame;
- railway carriages (two biaxial railway carriages);
- ring support
- ladle;
- ladle tilting mechanism;
- automatic coupler.

Advantages: enforced axle bearings.

The slag car is supplied with electric motor. The control equipment is not included to the scope of supply.

SPECIFICATIONS	VALUE				
	ShTD-11	ShTS-11	ShTD-16	ShTS-16	ShTD-16,5
Carriage capacity, t	80	80	80	80	80
Maximum ladle tilting angle, degree	118	118	118	118	114
Number of loaded hot metal ladle cars moving in a formation	70	70	70	70	70
Track gauge, mm	1520, 1435, 1676				
Electric motor, type :	MTKR 312-8				
- power, kW	7,5	7,5	7,5	7,5	7,5
- rotation rate, rpm	695	695	695	695	695
Reducer, type:	Worm-cylinder				
- length (along the couplers axes), mm	8100	8100	8100	8100	8100
- width, mm	3480	3480	3610	3610	3360
- height (from the rail head to the upper ladle edge), mm	3615	3615	3945	3945	3855
Weight, max, kg:	55000	58000	65000	66000	65000

Manufacturing period – 90 days

SLAG CAR WITH SCREW LADLE TILTING GEAR

TStandard series: ShV-11D, ShV-11S, ShV-16D, ShV-16S, ShV-16,5D.
Slag car with screw ladle tilting gear is designed for in-plant transportation of molten slag with temperature of up to 1600°C in the slag ladles with capacity of 11, 16 and 16,5 m^3. The slag cars with capacity of 11 and 16 m^3 are equipped with a round ladle of circular cross-section with a spherical bottom, and the slag cars with capacity of 16,5 m^3 – with a ladle with oval cross-section. The slag cars with the ladles for blast-furnace slag (ShV-…D) and the ladles for steelmaking (ShV-…S) are produced.

The slag car consists of:
- bearing frame;
- railway carriages;
- ring support
- ladle;
- ladle tilting mechanism;
- automatic coupler.

Advantages:
- heavy-duty thrust bearings;
- increased frame rigidity;
- rack bar is made with windows between the racks for spillage of slag and waste;
- heavy-duty screws.

SPECIFICATIONS	VALUE				
	ShV-11D	ShV-11S	ShV-16D	ShV-16S	ShV-16,5D
Carriage capacity, t	80	80	80	80	80
Maximum ladle tilting angle, degree	118	118	118	118	118
Number of loaded hot metal ladle cars moving in a formation	120	120	120	120	120
Track gauge, mm	1520	1520	1520	1520	1520
Overall dimensions, mm:					
- length (along the couplers axes) - width - height (from the rail head to the upper ladle edge)	7850 3480 3615	7850 3480 3615	7850 3580 3945	7850 3580 3945	7850 3580 3650
Weight, max, kg:	62000	66000	68000	72000	70000

Manufacturing period – 120 days

SLAG LADLES

Slag ladle is designed for collection of molten slag discharged from furnaces, steelmaking and ferroalloy units. The ladles are filled with the slag with temperature of up to 1600°C and density of up to 3,7 t/m^3.

In the upper part of the ladle there are four castings with spaces for ring support tooth designed to install the ladle on the slag car. The Martin ladles has four more castings with space that allows to transport it with the lifting beam and a circular stiffening hooping. Four castings are made in the lower part – T-shaped gauges designed to lock the ladle in the ring support that excludes any possibility of its fallout in the process of slag car movement.

SPECIFICATIONS	VALUE			
Ladle designation	Capacity, m^3	Diameter, mm	Height, mm	Weight, kg
Railway slag cars:				
For furnace slag	11	3350	2870	13680
For steelmaking slag	11	3350	2870	15200
For furnace slag	16	3570	3300	20200
For steelmaking slag	16	3570	3300	21110
For steelmaking slag (heavy-duty)	16	3640	3300	22900
For furnace slag (oval ladle)	16,5	4270x3350	2860	21600
Ladles for automatic slag cars:				
For steelmaking slag	11	3310	2950	18490
For steelmaking slag	16	3570	3430	33450

Manufacturing period – 30 days

LADLES OF 2 M^3 AND 5 M^3

The ladles are designed for collection and transportation of molten slag with temperature of up to 1500°C.

SPECIFICATIONS			
Capacity, m^3	Overall dimensions		Weight, kg
	Height, mm	Width in spouts, mm	
2	1600	2550	5480
5	2240	3160	11800

Manufacturing period – 30 days

DETAILS OF THE SLAG DEVICE

The slag device is designed to discharge the slag from the furnace.

SPECIFICATIONS	VALUE
Operating pressure in furnace, MPa	0,30
Cooling water pressure, MPa	0,65

Manufacturing period – 120 days

SKIP

Skip is designed for transportation of burden materials from the skip pit to the blast-furnace throat to the reception hopper of the charging device. The skip consists of the body, front and rear wheelpair and traction equipment. In order to increase the capacity and facilitate the loading and unloading of material the front edge of the body is made broadened. The bottom and walls are protected from wearing with the furnace charge with the alloy steel plates. In the upper part of the body there is a hole for charging the waste and spills formed in the skip pit. The skips are produced with the hinging of the front and rear wheelpairs.

Advantages: increased capacity.

SPECIFICATIONS	VALUE			
Skip struck capacity, m^3	6,5	8	10	20
Skip blending capacity, m^3	5,5	6,5	9	17
Skip net loading capacity, ton-forcec	12	15	23	35
Main track, mm	1454	1454	1660	2420
Base, mm	1800	2400	2400	3100
Diameter of running wheels, mm	500	500	500	700
Weight, kg	8920	10000	9260	21900

Manufacturing period – 100 days

BATCH DISTRIBUTOR

Batch distributor is included into the scope of furnace charging gear and is designed to distribute batch materials around the large cone of the charging gear. At the same time it is used to pressurize the furnace body.

SPECIFICATIONS	VALUE
Useful capacity of revolving hopper, m^3	10
Diameter of the small cone, mm	2000
Steady rotation rate of revolving hopper, rpm (degrees/sec)	3,27 (19,62)
Centralized grease	CYATIM 203

Manufacturing period – 120 days

CHARGING MACHINE

Standard series: TM-16, TM-20, TML-16, TML-20.
Charging machine is designed to move the hot-metal and slag ladle formations around the furnace and perform maneuvering operations at the working railway section.

The charging machine consists of:
- bearing frame;
- driven running wheels;
- cab;
- electric drive;
- remote control system;
- automatic coupler.

Main advantages:
- no necessity to use additional gears at stopping of the formation during the casting process;
- high serviceability.

The charging machine is supplied with a tension winch for the rope bearing the electric cables (ТМЛ type) or without a winch (ТМ type).

SPECIFICATIONS	VALUE			
Type	TM-16		TM-20	
Thrust at breakaway (pushing power), ton-force	16		20	
Adhesion weight of charging machine, minimum, t	72		80	
Travel speed, m/s	0,25	0,4	0,25	0,4
Control	Remote			
Track gauge, mm	1520, 1435, 1676			
Electric motor, type :	MTKN-411-6U2	MTKN-412-6U2	MTKN-411-6U2	MTKN-412-6U2
- power, kW	22	30	22	30
- rotation rate, rpm	935	940	935	940
Reducer, type :	Two-stage right-angle			
Overall dimensions, mm :				
- length (along the automatic coupler axes)	9390		9390	
- width	2640		2640	
- height ((without post)	3030		3030	
Weight, kg:				
- winch excluded	72000		80000	
- winch included	74000		82000	

Manufacturing period – 120 days

FURNACE COOLING PLATES

Furnace cooling plates are designed to protect the furnace mantle from high temperatures impact, preserve the efficient brickwork profile and increase the furnace life by 8…10 years. The cooling plates for furnaces with capacity of 1033 to 5400 m^3 are produced. The design of the cooling plates allows to pressurize the furnace mantle. The cooling plates operate on evaporation, water and mixed cooling. The peculiar feature of the cooling plates is the availability of four cooled pipes with separate water supply. When one of the pipes breaks down, the cooling plate keeps operating. Nodular iron may be used for production of cooling plates. The carbon content is reduced in seamless pipes casted into the metal and they have the increased relevant extension. The pipes casted have the optimal plasticity value. The cooling plates may be designed and produced according to the customer's requirements.

Manufacturing period – 160 days .

FURNACE CHARGING GEAR (CUP-AND-CONE)

Cup and cone are designed to perform the function of distribution and locking of batch materials and gas sealing of the blast-furnace mouth.

The cup and cone have the increased wear resistance of contact belts due to availability of carbide and chrome welding. The gas tightness is reached due to the precise geometry received in the result of accurate grinding performed on precision equipment. To stabilize the dimensions the cup and the cone are put through a special heat treatment.

Advantages: geometrical dimensions stability.

SPECIFICATIONS	VALUE				
Specified diameter of cup and cone, mm	5400	5000	4800	4200	3600
Furnace capacity, m^3	2000	1719	1386	1033	700
Cone weight, kg	27100	23200	20000	16300	8100
Cup weight, k	16200	15600	22100	10200	13700

Manufacturing period – 120 days

BLAST-FURNACE CONE

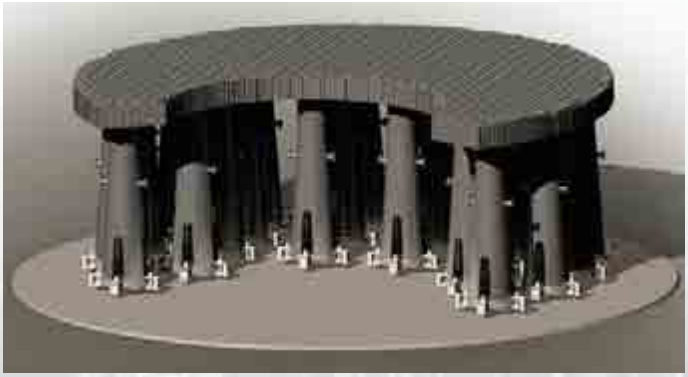
Blast-furnace cone is designed to ensure the pressure tightness of the furnace and to install the charging gear, blast-furnace gas discharge tubes and other processing equipment thereto. The blast-furnace cone is a metal construction made of sheet metal and blast-furnace gas discharge tubes installed on it. The inner surface of the cone and of the blast-furnace gas discharge tubes is lined with the plates made of 35Л steel.

SPECIFICATIONS	VALUE
Diameter, mm	7380
Height, mm	6000
Tubes diameter, mm	1700
Weight, kg	133000

Manufacturing period – 180 days

NOSTRIL GEAR

Nostril gear is an integral part of the blast-furnace heater. It is designed to heat the air blast entering the blast-furnace performing the function of the heat-exchanging unit. The nostril gear operates in the final gases environment with constant temperature of up to 400°C. The nostril gear consists of grids, columns and plates. All the details of the nostril gear are casted of ЧХ1 cast-iron. When assembled, the grids of the nostril gear are fixed onto the columns and the plates are fixed to the grids with pins. Then the whole construction is lined.



SPECIFICATIONS	VALUE
Operation temperature, °C	400
Diameter, mm	3643
Height, mm	2630
Weight, kg	74280

Manufacturing period – 120 days

SCREW DUST UNLOADER

Screw dust unloader is designed to humidify and remove the dust from the dust collector of blast-furnaces and simultaneously suppress the fine dust.

The dust unloader is a screw mixer onto which the gears for dust suppression and shutdown valve are installed. The highly wearing parts are protected with sheets with welding. To remove the abrasive dust impact all the bearings are equipped with packing seals.

The gear for dust suppression consists of two cyclones installed on the screw mixer and vibrators installed on their external side that prevent the walls of cyclones from dust adhesion.

SPECIFICATIONS	VALUE
Capacity, m^3/h	up to 100
Water arte for humidifying, maximum, m^3/h	25
Additional dust reclaiming, t/day	5
Shutoff valve diameter, mm	350
Shutoff valve opening force, kilogauss	2000
Electric motor power, kW	11
Overall dimensions, mm : - length - width - height with cone tube - height without cone tube	 4880 1600 2266 2556
Number of cyclones, pcs	2
Weight, kg	9885

Manufacturing period – 80 days

ROPE SHEAVE

Rope sheaves are designed to direct the ropes of the blast-furnace skip hoist.

SPECIFICATIONS	VALUE	
Sheave diameter, mm	2000	2000 (enhanced)
Internal radius of the groove form, mm	28	28
Axis diameter, mm	200	220
Weight, kg	2827	2885

Manufacturing period – 90 days

TILTING RUNNER

Tilting runner is designed to variably change the direction of the molten iron stream or slag to the hot-metal or slag ladle cars.

The tilting runner consists of:
runner itself, cradle, crank gear and electric drive. The surface of the runner is lined and the runner is fixed on the travelling cradle.

The drive of the runner consists of:
welded frame, electric drive, brake, worm reducer, cylinder reducer, controller. There is a hand drive to rotate the runner from the wheel with the electric drive start blocking.
Hot iron and slag come to the tilting runner from the nose of the stationary channel.

SPECIFICATIONS	VALUE
Rotation angle of the tilting runner from horizontal position to every side of the draining (working position), degrees	10
Rotation angle of the tilting runner from horizontal position to the position of full draining, degrees	40
Rotation time of the tilting runner between the working positions, s	9
Drive: - electric motor power, kW - electric drive shaft rotation rate, rpm	 4,5 900
- electric drive gear ratio	787,5
Overall dimensions, mm: - tilting runner length - distance between the supports	 4000-5400 3100-3300
Weight, max, kg	8800

Manufacturing period – 90 days

GAS SAMPLING MACHINE

Gas sampling machine is designed to select the gas samples under the furnace mouth with the test pipe through the special cooler.

Advantages:
- enhanced drive capacity;
- enhanced probe feed thrust (up to 15 t);
- increased probe rigidity.

SPECIFICATIONS	VALUE		
Maximum path of the test pipe, mm	4900	5500	6000
Test pipe travel speed, m/s	0,194	0,194	0,194
Number of test points, pcs.	8	8	8
Stay time of the pipe in the furnace shaft during a gas extraction period, maximum, min	2,45	2,75	3
Outer diameter of the test pipe, mm	76	76	76
Overall dimensions, mm : - length - width - height	13055 13055 13055	1980 1980 1980	1560 1560 1560
Weight, kg	7420	7420	7420

Manufacturing period – 90 days

WATER FILTER

Water filter is designed to perform primary mechanical purification of water, fractions over 6,3 mm, supplied to the blast-furnace cooling system. The filters may be supplied either with a hand or electric drive.

SPECIFICATIONS	VALUE		
Nominal diameter, mm	400	500	600
Working water pressure, mPa	0,65	0,65	0,65
Capacity, m^3/h: - at water velocity of 1,5 m/s - at water velocity of 2,5 m/s	 690 1180	 1040 1800	 1040 1800
Sieve size, mm	6,3	6,3	6,3
Weight, kg	3300	5470	6835

Manufacturing period – 160 days

BLAST-FURNACE MAIN EQUIPMENT

BYPASS VALVE

Bypass valve is designed to reduce pressure in the blast-furnace stove when its mode is changed from "standby" to "blasting" before opening of the cold blast shutoff valve.
The DN500 valve is supplied with electric drive, controller and end switch.

SPECIFICATIONS	VALUE	
Type	DN350	DN500
Nominal diameter, mm	350	500
Working pressure, MPa	0,5	0,5
Gas temperature, K (°C)	523 (250)	673 (400)
Opening (closing) time, s	5,4 (3,6)	15 (15)
Valve travel, mm	100	130
Drive, type	hydraulic	electric
Electric motor, type :	-	ARF53-8У-3
- power, kW	-	2,2
- rotation rate	-	640
- current type	-	alternating
- voltage, V	-	380
Reducer, type :	-	renveloping worm-gear with bevel drive
Gear ratio: - when operated from electric drive - when operated from hand drive	-	 320,3 640,6
Controller, type	-	KA 4658-1 U2
Overall dimensions, mm: - length - width - height	 1890 640 780	 1815 1770 1125
Valve weight, max, kg	1130	2200

Manufacturing period – 150 days

EQUALIZING VALVE

Equalizing valve is designed to operate as a gas shutoff valve of the blast-furnace charging gear. The valve is installed on vertical sections of the filling gas mains intended to supply gas to the interbell space of the blast-furnace charging gear to equalize pressure in it with the gas pressure in the furnace mount as well as of the gas mains intended to discharge gas from the interbell space to the atmosphere to equalize the pressure in the interbell space with atmospheric pressure.

The valve is supplied with electric drive, controller, position and end switches.
The control equipment is not included to the scope of supply.

SPECIFICATIONS	VALUE	
	DN300	DN450
Nominal diameter, mm	300	450
Working pressure, MPa	0,37	0,37
Opening (closing) time, s	3	3
Valve operation	reverse	reverse
Temperature, max, K (°C)	723 (450)	723(450)
Electric motor, type :	2AIMS160L8	4AM200M8
- power, kW	7,5	18,5
- revolutions per minute	750	750
Controller, type	KA 4658-1U2	KA 4658-1U2
End switch, type	VP 15E21A231-54U2,8	VP15E
End switch, type	KU-701 AU2	KU-701 AU2
Overall dimensions, mm: - length - width - height	 1820 1695 1265	 2200 2130 1775
Weight, kg	2570	4451

Manufacturing period – 90 days

SLIME VALVE

Slime valve is designed to ensure the possibility of discharge of slime settling in the gas-cleaning plants of metallurgical shops.

SPECIFICATIONS	VALUE
Nominal diameter, mm	300/250
Working pressure, MPa	0,3
Overall dimensions, mm: - length - width - height	 1353 618 760
Weight, kg	220

Manufacturing period – 120 days

GOGGLE VALVE

Goggle valves of DN350, DN500 types are designed to completely shutoff the equalizing valves of the charging gear from the working chamber when the maintenance operations or revisions are held. The valves are installed on vertical sections of the mains.
Goggle valves of DN1100, DN1300 types are designed to completely shutoff the stoves from the gas mains and air mains coming from the central ventilation station of the air mains when the maintenance operations or revisions of the stoves are held.
The valves are installed on vertical sections of gas and air mains.

SPECIFICATIONS	VALUE				
	DN350	DN400	DN500	DN1100	DN1300
Nominal diameter, mm	350	400	500	1100	1300
Working pressure, MPa	0,25	0,37	0,37	0,012	0,012
Working temperature, max, K (°C)	373 (100)	373 (100)	373 (100)	373 (100)	373 (100)
Valve rotation angle, degree	90	90	90	105	105
Overall dimensions, mm: - length - width - height	 1060 910 366	 1045 885 397	 1300 1093 424	 2740 1670 700	 3170 1850 700
Weight, kg	338	351	579	1467	1960

Manufacturing period – 60 days

SECTORAL VALVE

Sectoral valves of DN2400, DN2000 types are designed to shutoff the gas main of semiclear gas and clear furnace gas.
The valves are installed on horizontal sections of the mains.
An expansion pipe shall be installed on the gas main directly at the valve.
The sectoral valve consists of the following main units:

- welded shell consisting of the left and right parts;
- slide gate installed between the shell parts;
- fixed axle installed in the supports onto which the slide gate fits freely;
- slide gate swiveling gears and two (upper and lower) slide gate clamps.

SPECIFICATIONS	VALUE	
	DN2000	DN2400
Nominal diameter, mm	2000	2400
Working pressure, MPa	0,03	0,03
Total gear ratio of the slide gate swiveling gear	7933	9066
Slide gate rotation time during the electric drive operation, s	84	96
Electric motor, type	AIMM100S4U2.5	AIMM100S4U2.5
Weight, kg	4400	4910

Manufacturing period – 150 days

GAS DAMPER

Gas damper is designed to shutoff the interbell space from atmosphere and prevent the gas from discharging from the furnace as the large cone is opened.
The gas damper is a welded cylinder-cone shell consisting of two bolted-type connections and welded plates of parts.
The upper flange od the gas damper has oval holes and grooves for the sealing cord. The batch distributor is installed thereto.

SPECIFICATIONS	VALUE
Nominal diameter of the cylinder part, mm	5550
Nominal diameter of the cone part, mm	2960
Height, mm	3180…3500
Overall dimensions, mm: - length - width - height	 1050 3145 7020
Weight, kg	17800…18500

Manufacturing period – 60 days

THERMAL GAS SHUTOFF

Thermal gas shutoff of DN2000/1700 type is designed to shutoff separate gas cleaning units and main sections from the general gas network and is installed on horizontal section of the gas main.
The gas shutoff may be switched on manually when current or electric drive fails.
The gas shutoff is supplied with electric drive, controller, microswitch, electric contact thermometer, gate valves and return valves installed on the mains to supply steam and to supply and remove cooling water.
The controlling equipment and welded chain for sprocket of hand drive are not included to the scope of supply.

SPECIFICATIONS	VALUE
Nominal diameter of the gas main, mm	2000
Nominal diameter of the shutoff, mm	1700
Gas main pressure, MPa	0,025
Steam temperature, K (°C)	423…473 (150…200)
Steam pressure, MPa	0,6…1
Time of the shutoff changing with the drive, s	75
Overall dimensions, mm:	
- length	4072
- width	3752
- height	4800
Weight, kg	10500

Manufacturing period – 90 days

BLEEDER STACK DN250

Bleeder stack of DN250 type is designed to blow through and ventilate separate gas main sections and hot-blast stove gas burner housing. The bleeder stack is installed on vertical section of the gas main.

The bleeder stack consists of the following main units:

- housing;
- valve seat installed in the housing;
- shutoff plate;
- driven shaft;
- crank gear;
- electric and mechanic drive.

SPECIFICATIONS	VALUE
Nominal diameter, mm	250
Gas working pressure, MPa	0,15
Plate opening angle, degree	75
Opening time, s	3
Electric drive: - type - power, kW - rotation rate, min	 AIM 71B6 0,55 900
Controller	KA 4658
Overall dimensions, mm: - length - width - height	 1580 1025 1173
Weight, kg	1329

Manufacturing period – 60 days

BLEEDER STACK DN250

Bleeder stacks of DN250 and DN400 types are designed to discharge gas from the dust collector into the atmosphere. The bleeder stacks are installed on vertical sections of the gas bleeders.
Bleeder stack of DN800 type is designed to discharge gas from the dust collector into the atmosphere.
The furnaces are usually equipped with two such bleeder valves installed in the upper parts of the gas bleeders.
The bleeder stack consists of the following main units: housing, seat, shutoff plate, driven shaft, regulator.
The stacks are opened with a separate electric winch. The shutoff plate is pressed to the seat of the stack with the counterbalance.

SPECIFICATIONS	VALUE		
	DN250	DN400	DN800
Nominal diameter, mm	250	400	800
Working environment	gas	gas	gas
Working pressure, MPa	0,37	0,37	0,25
Gas temperature, K (°C))	623…723 (350…450)	593 (320)	723 (450)
Overall dimensions, mm : - length - width - height	 2816 410 912	 1860 680 2020	 3320 1560 2620
Counterbalance weight, kg	400	2000	3300
Bleeder stack weight, max, kg	723	799	2630

Manufacturing period – 80 days

COLD-BLAST VALVE

Cold-blast valve is designed to completely shutoff the stove from the cold blast air duct. The valve of gate type has got no cooled elements. The valve is installed on vertical section of air main near the stove.

The cold-blast valve consists of the following main units:

- housing with a cover;
- choke with a relief valve;
- drive.

The cold-blast drive may operate in the automatically driven system.

The valve is supplied with electric drive, brake, controller and position switch.

The controlling equipment is not included to the scope of supply of the cold-blast valve.

SPECIFICATIONS	VALUE	
	DN1200	DN1400
Nominal diameter, mm	1200	1400
Air pressure, MPa	0,42	0,42
Air temperature, maximum, K (°C)	473 (200)	473 (200)
Opening time upon the pressure equalization, s	12	12
Permissible pressure difference, max, MPa	0,03	0,03
Electric motor power, kW	2,5	2,5
Overall dimensions, mm: - length - width - height	 5964 2515 1356	 6819 2715 1466
Weight, kg	7647	8702

Manufacturing period – 120 days

HOT-BLAST VALVE

Hot-blast valve is designed to shutoff the furnace stove from the hot blast air duct when the stove is operating in the "heating" mode or is completely shutoff from the furnace. The valve is installed on horizontal section of air main near the stove. The valve may be used as a shutoff valve.

The hot-blast valve is produced in two models:

- «В» - with water cooling;
- «И» - with evaporation cooling.


Диплом
ФІНАЛІСТ
клапани гарячого дуття ПГД-1300

Main advantages of the hot-blast valve:

- middle part of the housing, welded rings and plate housing are made as one-piece of low-alloyed steel that allows to increase the thermal stability of these details by 2-3 times;
- lower part of the plate has got high-temperature protective coating that is 0,5 -1 mm thick;
- possible to supply with hydraulic or electric drive.

Main design features of the hot-blast valve:

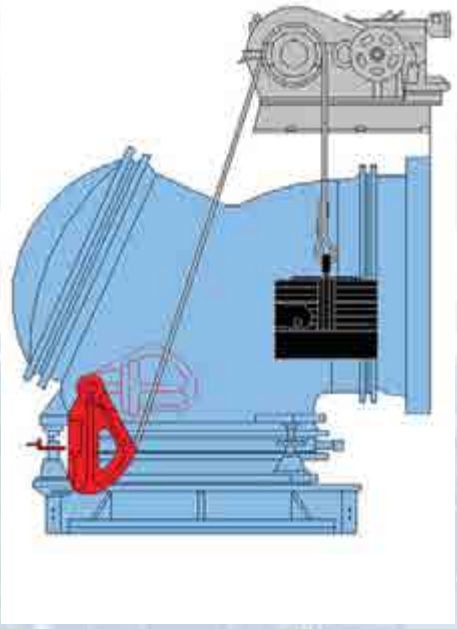
- welded joints are protected with refractory lining;
- increased rigidity of housing and cover;
- increased thickness of the rings lining;
- interchangeability of the main units;
- high-temperature ramming of carbon threads that allows to increase the service life without changing of sealing up to over 12 months.

SPECIFICATIONS	VALUE		
	DN1100	DN1300	DN2000
Nominal effective section diameter, mm	1165	1300	2000
Hot-blast temperature, max, K (°C)	1873 (1600)	1773 (1500)	1873 (1600)
Hot-blast pressure, max, MPa	0,5	0,55	0,5
Time of the valve closing (opening), max, s	10	12	11
Pressure in the cooling system, maximum, MPa	0,55	0,6	0,6
Overall dimensions, mm: - length - width - height	 500 2684 5590	 700 3152 6740	 1050 3145 9470
Weight, max, kg	6600…6800	11585…11800	20910…21310

Manufacturing period – 120 days

FUME VALVE

Fume valve is designed to shutoff the stove from the intake of the fume pipe during the air heating as well as to withdraw the combustion products from under the stove to the chimney.



The fume valve consists of: housing, cover, plate and cooled seat.
The plate is connected with the regulator through the joint. The driven sector is hardly landed on a single axle with the regulator and is connected with the winch through the rope.
The valves may be produced either right or left according to the drive position.

SPECIFICATIONS	VALUE	
	DN1100	DN1300
Nominal diameter, mm	1100	1300
Working pressure on the stove side, MPa	0,3	0,52
Temperature of the gas passing, max, K (°C)	673 (400)	673(400)
Time of the valve opening with drive, s	7,5	10
Time of the valve opening with air, s	35	40
Overall dimensions, mm : - length - width - height	 2000 2000 2200	 2150 2150 2570
Weight, kg	5640	7500

Manufacturing period – 150 days

GAS SHUTOFF

Gas shutoff is designed to shutoff the gas main and regulate the gas flow in the mains and branch pipelines of sinter plants, furnace and other shops of metallurgic plants.
The following models and dimensions are produced: DN2000, DN2000PN2,5, DN2400.

SPECIFICATIONS	VALUE		
	DN2000	DN2000PN2,5	DN2400
Nominal diameter, mm	2000	2000	2400
Working drive	electric	electric	electric
Time of valve closing (opening), max, s	110	331	130
Emergency drive	hand	hand	hand
Gain on the wheel of the hand drive, max, H	200	400	200
Electric motor power, kW	7,5	7,5	7,5
Excessive gas pressure in the gas main, MPa	0,015	0,25	0,015
Gas temperature, K (°C)	433(160)	473 (200)	433 (160)
Overall dimensions, mm:			
- length	2525	2548	2945
- width	850	1250	920
- height	9600	9220	11245
Weight with counterflanges, kg	8345	12852	11752

Manufacturing period – 90 days

TUYERE CONNECTIONS

Tuyere connections are designed to supply hot air blast and natural gas through the air tuyere to the furnace well.

The tuyere connections consist of the three main units:

- stationary part fixed on the housing of the furnace well;
- blast connection (tuyere) stock connecting the stationary part to the hot-blast circulating duct;
- springing attachment (buckle).

The tuyere connections are installed directly near the furnace connecting it to the hot-blast circulating duct.

The connections are supplied without the refractory lining.

SPECIFICATIONS	VALUE
Hot-blast temperature, K (°C)	1473 (1200)
Hot-blast pressure, MPa	0,4
Natural gas pressure, MPa	0,5
Pressure of the cooling medium, MPa	0,5
Overall dimensions, mm: - length - width - height	 2700 1100 3200
Weight, kg	3430

Manufacturing period – 120 days

THROTTLE GAS VALVE

Throttle gas valve is designed to regulate the amount of gas supplied to the gas burner of the furnace stove and complete shutoff of the burner from the gas main during normal operation or when the current fails. The valve is installed on vertical section of the gas main.

The throttle gas valve consists of the following main units:

- housing;
- two-stage worm reducer;
- flange electric drive;
- magnet support with electric magnetic coil;
- drive;
- switch.

SPECIFICATIONS	VALUE		
	DN1100	DN1300	DN1500
Nominal diameter, mm	1100	1300	1500
Excessive gas pressure, kPa (mm.w.column)	7,85 (800)	7,85 (800)	14,7 (1500)
Gas temperature, K (°C)	343 (70)	343(70)	343 (70)
Two-stage worm reducer:			
- gear ratio	1120	1120	1120
Electric drive:			
- type	ARM43-10.U3	ARM52-10.U3	ARM53-10.U3
- power, kW	0,63	1,3	2
- rotation rate, rpm	530	530	530
- model	1M3002	1M3002	1M3002
Brake coil, type :	ТКП400U2	ТКП500U2	ТКП500U2
- voltage, V	110	110	110
Position switch	VP16PG23B231-55.U23	VP16PG23B231-55.U23	VP16PG23B231-55.U23
Selsyn sensor:	BD 501AU3	BD 501AU3	BD 501AU3
- voltage, V	110	110	110
Overall dimensions, mm: - length - width - height	 2590 1540 1143	 2820 1875 1143	 2946 1875 1266

Manufacturing period – 90 days

THROTTLE UNIT

Tightened throttle unit is designed to maintain the excessive pressure under the blast-furnace mouth by way of throttling the air stream with DN425 and DN1000 valves. The operating motors are used as valve drives.

The throttle unit consists of:

valves of DN425 and DN1000 types installed on the bearing pipe and closed with the irrigation diffuser, as well as other valves according to the customer's base data.

SPECIFICATIONS	VALUE
Gas pressure, kg/cm (MPa)	2,5(0,25)
Gas temperature, K (°C)	303…325 (30…50)
Gas content at the output, mg/mm	100
Water flow for spraying, m/h	50…70
Throttle rotation angle, degree	0…90
DN425 throttle rotation time for 90°, s	25
DN1000 throttle rotation time for 90°, s	63
Overall dimensions, width*height, mm	3750*4250
Weight, kg	20423

Manufacturing period – 150 days

VALVE DX2000

Valve of DX200 type is designed to regulate the flow of gas-air medium up to 200°C and is installed in the air and gas networks of the blast furnaces.

The valve of DX2000 type consists of: housing in which the valve gate is installed on the shaft with bearings. Single-turn actuator is used as a drive.

SPECIFICATIONS	VALUE
Nominal diameter, mm	2000
Maximum medium pressure, MPa, max	0,1
Overall dimensions, mm: - length - width - height	 2666 750 2200
Weight, kg	1706

Manufacturing period – 90 days

UNIFIED DAMPERS OF УМТ TYPE FOR METALLURGIC MAINS

Multiple leaf dampers are designed to regulate the gas-air medium and are installed on the mains of ventilation system, gas and dust cleaning and combustion products withdrawal in the heating and baking furnaces, in the main and auxiliary shops of metallurgic and other industrial enterprises. The УМТ dampers operate at the pressure of the medium in the main not exceeding 0.005 MPa and medium temperature not exceeding 425°C.

The dampers are classified as low-volume products that are finally assembled at the customer's site.

2 types of the valves according to their design are produced: square and rectangular, which also differ in the position of the driven shaft.

SEPARATING FLAPPER

Separating flapper is designed to quickly shut off the flow cross-section of the mixing cold blast pipe in case the blast supply to the furnace is stopped in order to prevent the possibility of penetration of hot gases from the furnace to the cold blast pipe. The flapper may operate in the automatic control system.
The flapper has got a vertical flap and is installed at the horizontal section of blast pipe.
Left-hand and right-hand flappers depending on the drive location are produced and supplied with electric drive, brake, controller and position switches.

SPECIFICATIONS	VALUE
Nominal diameter, mm	1200
Air temperature, max, K (°C)	673 (400)
Air pressure, MPa	0,52
Flapper opening time, s	14
Electric motor:	
- type	АРМ 53-8У3
- power, kW	2,5
Brake, type	ТКП 200
Reducer, type	worm-differential
Overall dimensions, mm:	
- length	1583
- width	2591
- height	5753
Weight, kg	8585

Manufacturing period – 120 days

GAS SHUTOFF VALVE

Gas shutoff valve is designed to be installed on the coneless charging gear.
The disk gas shutoff valve with spherical contact surface separates the charge tract from the atmosphere and blast-furnace body. One of the main advantages of the valve design is an opportunity of assembly replacement that makes the operation more comfortable.

SPECIFICATIONS	VALUE
Nominal diameter, mm	800
Gas temperature, K (°C)	623 (350)
Gas pressure, , MPa	0,25
Gas pressure in the cooling system, MPa	0,25
Pressure in blow system, MPa	0,4
Valve opening (closing) time, s	4
Valve opening degree, degree	85
Overall dimensions, mm: - length - width - height	 2870 2867 960
Weight, kg	7700

Manufacturing period – 90 days