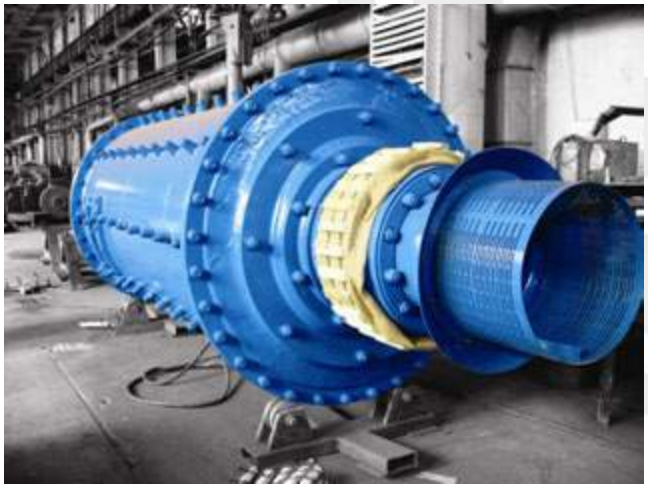
Samara plant
«Strommashina»



The main fields of concern.

Industry branches

Branches

- Metallurgical branch
- Building branch
- Road branch
- Mining branch
- Chemical branch
- Oil and Gas branch

The main fields of concern. Types of equipment

Types of equipment

- Grinding
- Drying
- Transport
- Reservoirs
- Aspiration
- Calcinating

The main fields of concern.
The main types of products

Types of products

- Equipment for mineral dust production
- Equipment for keramzit production
- Equipment for gypsum binder production
- Equipment for grinding and drying inert material
- Equipment for drilling wastes thermal utilization
- Special processing equipment

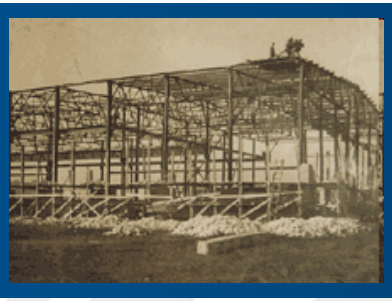
The main fields of concern.

Engineering and maintenance

Engineering and maintenance

- Project technical concept development
- Project preliminary commercial value estimating
- Project works running
- Installation supervision (technical and designer supervision)
- Equipment maintenance, repair, and operations
- Spare parts delivery in agreed schedule
- Equipment technical audit

Milestones

2nd of November 1942

- Plant foundation day

Till the end of 1945

- Manufacture of weapons

1945

- Peaceful production : roatary self-steamers, water-jacket furnaces, dampers, drying cylinders, traveling trolleys




Milestones




1946

- The plant was handed over to the Ministry of Construction and Road Engineering and renamed to Kuybyshev plant "Strommashina".
- The plant has received a 100-ton forging press, guillotine-shears, unique machines and other equipment.

1999-2003

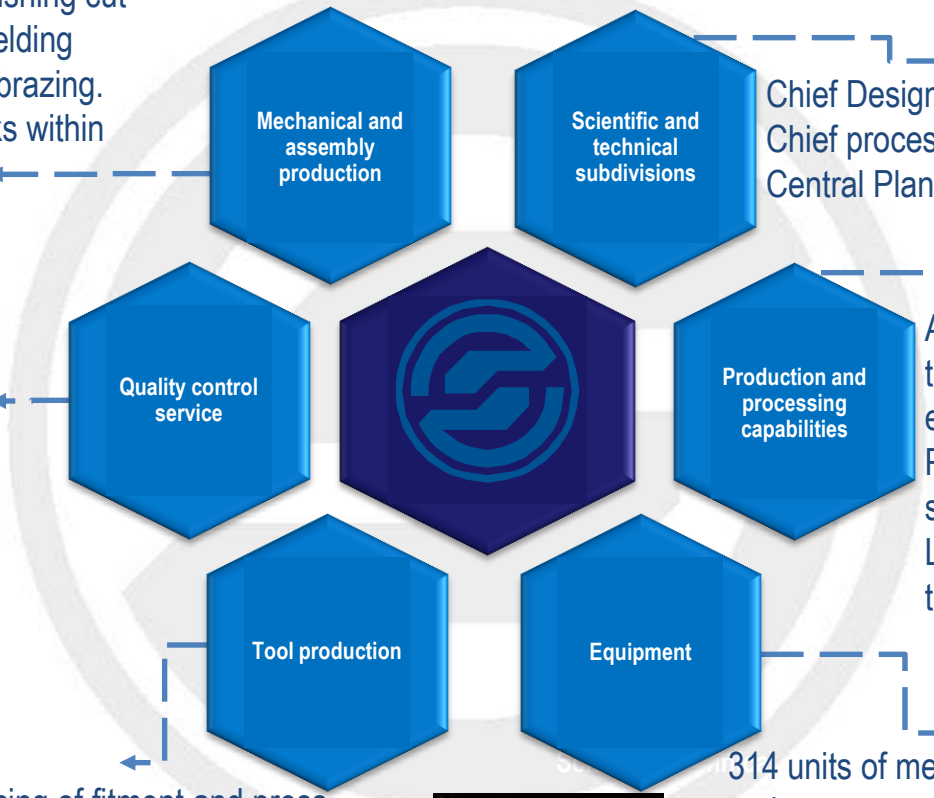
- The plant undergoes the effective procedure of upgrading the production and the processing base.

2005 - present

- The plant becomes an executor of government defense orders possessing leading positions in the market of industrial equipment.

Production

High level of accuracy and surface cleanliness of the materials to be machined, sheet-metal stamping is used, finishing cut and forming. Effective types of welding technologies and all the types of brazing. Monthly throughout of metal works within the scope of up to 400 tons.



Chief Designer Service (CDS)
Chief process engineer service (CPES)
Central Plant Laboratory (CPL)

All types of incoming inspections, quality policy accepted by the enterprise, and quality management system implemented.
Quality management system ISO 9001, SRPP VT, together with the requirements of GOST RV 15.002-2003 and “Oboroncertificate”certificate.

All types of production technologies of general engineering.
Production facilities: 90 000 sq.m.
Lifting mechanisms: up to 16 tons

Producing of fitment and press-forms, stamps, cutting tools and measuring instrumentation.

314 units of metal-cutting equipment of all the main types
27 CNC machines
15 units of electric welding equipment
2 galvanic machines
18 large-size turning lathe
2 large-size milling machines.

Service

Our goal is to create multiple services that will lead us to a new stage of production equipment quality, minimize wastes, and maintain it at the target level of technical readiness coefficient (TRC)

Service maintenance

- Engineering advice
- Assessment of current state, suggestions for increasing the TRC.
- Holding technical audit and service according to the agreed schedule.
- Replacement of assembly units and component parts.
- Delivery of the required spare parts in the specified terms.
- Determination of scope of works for equipment service.
- Warranted project running

Benefits

- Minimizing of unplanned stops (random failures) of the equipment
- Optimizing the structure of capital repairs of the equipment
- After repair inspection
- Increasing of repair intervals and equipment operation terms
- Identification and elimination of repeatable failures
- Reducing dead time duration for the equipment
- Enhance the level of industrial safety.
- Reduce operational costs of the enterprise.

Technologic manufacturing units for various industry branches

Branch	Technologic manufacturing units
Building branch	• For gypsum binder production • For keramzit production • For concrete units production • For grinding and drying of building formations (inert material, etc.)
Road building branch	• For mineral dust production (MP-1, MP-2)
Oil and gas branch	• For drilling wastes thermal utilization (drilling shludge)
Chemical branch Mining branch Metallurgy	• For grinding and drying of inert materials (ore, non-metallic formations, lime, ferroalloys, sand gravel, glass, ferros and non-ferros slags, etc.)

Production lines are designed and calculated according to the process material type and characteristics, conditions of its extraction and requirements towards the finished product

Multiple services for designing and delivering “key ready” technological complexes

Technological specification forming → Designing of technological process → Manufacturing

Delivering → Installation supervision → Instruction

Maintenance, spare parts delivery according to the set schedule

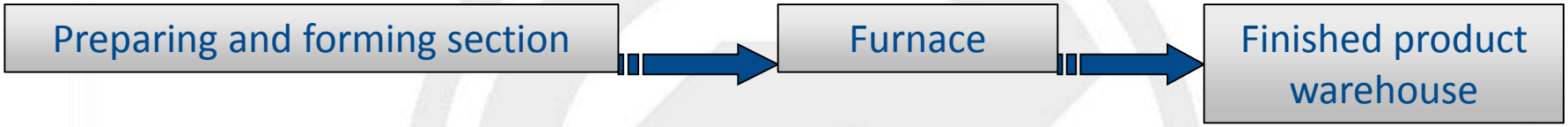
Sales geography

All regions of Russian Federation,
the Baltics, Ukraine, Belarus, Moldavia, Kazakhstan, Azerbaijan, Bulgaria, Poland, Iran, Mongolia, India, Vietnam

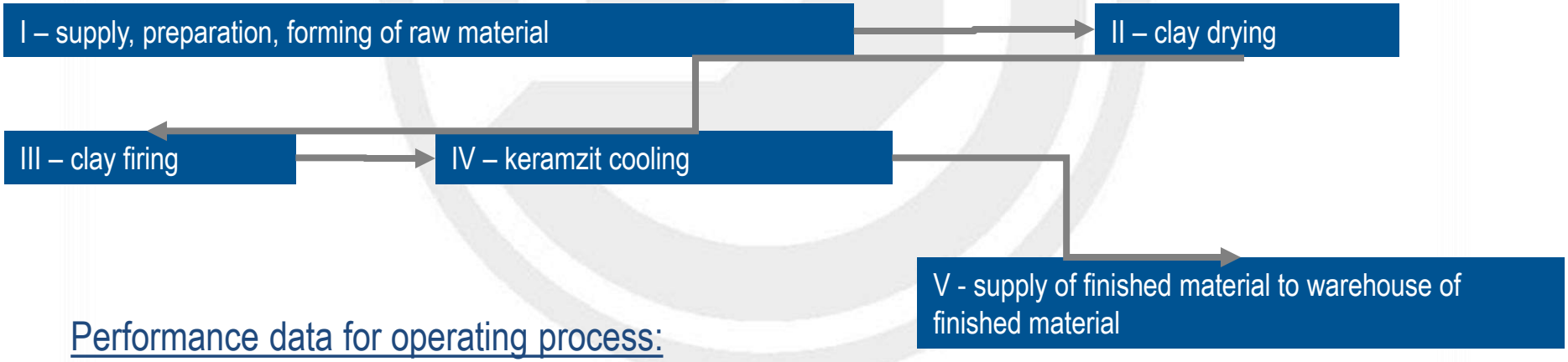
Building branch equipment

Technological complex of keramzit production

Process flow diagram



Technological process stages



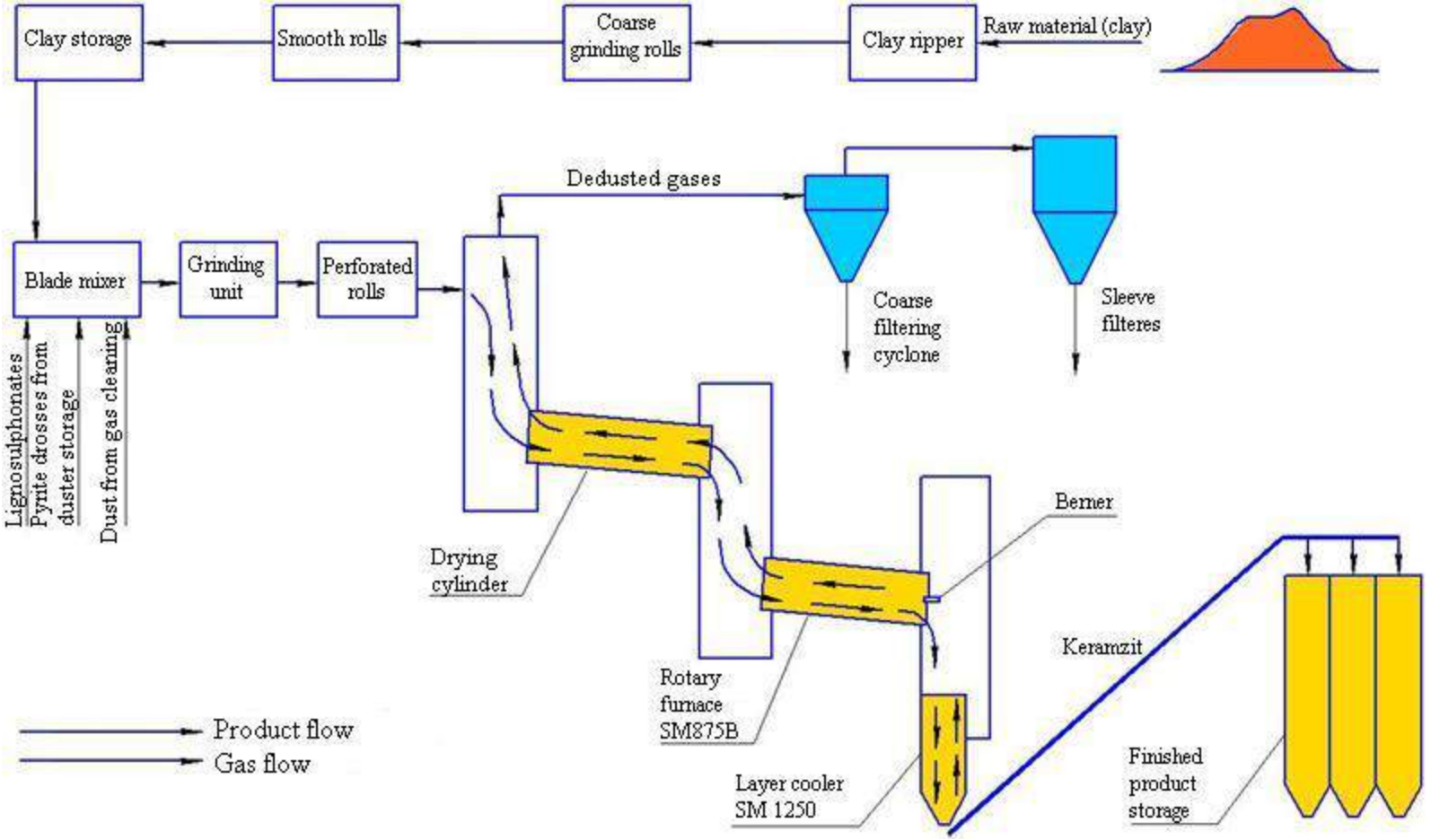
Performance data for operating process:

Capacity – 100 000 (200 000) m3 per year

Approximate maximum area with clay stock and finished product warehouse, m2 – 7200(14 400)

Summarized consumed power, annual, kW/h - 4 800 000 (9 600 000), 48 (96)kW per product ton

Keramzit producing diagram



The scheme is approximate. The final content of the equipment and the scheme become known after clay analyses and comparison of its properties with the required data of the customer.

Special processing equipment for keramzit production

Roating kiln SM875B (of variable section)

Kiln capacity at keramzit grade 350, m3/hour		16,8
Drum dimensions	Drum first casing inner diameter, m, not above	2,5
	Lenght, m, not above	20,5
Drum second casing inner diameter , m		3,0
Lenght, m, not above		16,5
Cone lenght, m, not above		3,0
Installed power - kW, not above		38
Mass (without SPTA), t, not above		125
Kiln slope, degree (%)		2 (3,5)
Specific energy consumption in a steady kiln operation mode, kW•h/ m 3, not a		2,55
Specific reference fuel consumption in a steady kiln operation mode , kg ref.fuel./ m 3		55
Kiln casing rotation frequency:	From main drive, rpm.	0,8-2,52
	From auxiliary drive, rph	3,1
Kiln dimensions	Lengh, m, not above	47,0
	Wteight, m, not above	5,5
	Height, m, not above	7,4
TU 22-106-68-90 OKP code 484681		

Special processing equipment for keramzit production

PV 2,5x40 (1218)

Capacity, m3/year	
Keramzit “400”	100000
Keramzit “500”	85200
Kiln casing length, m	40
Inner diameter, m	2,5
Kiln slope, %	3,5
Number of supports, pcs.	2
Type of support bearings	rolling
Kiln mass, t, not above	110
Number of rotations	
a) from main drive, rpm	0,8 - 2,52
b) from auxiliary drive, rpm	3,1
Adjustment range for rotation speed	smooth
Electric motor power	
a) main drive, kW	33
b) auxiliary drive, kW	2,2
Normative document	TU 22-3404-75 OKP code 484681

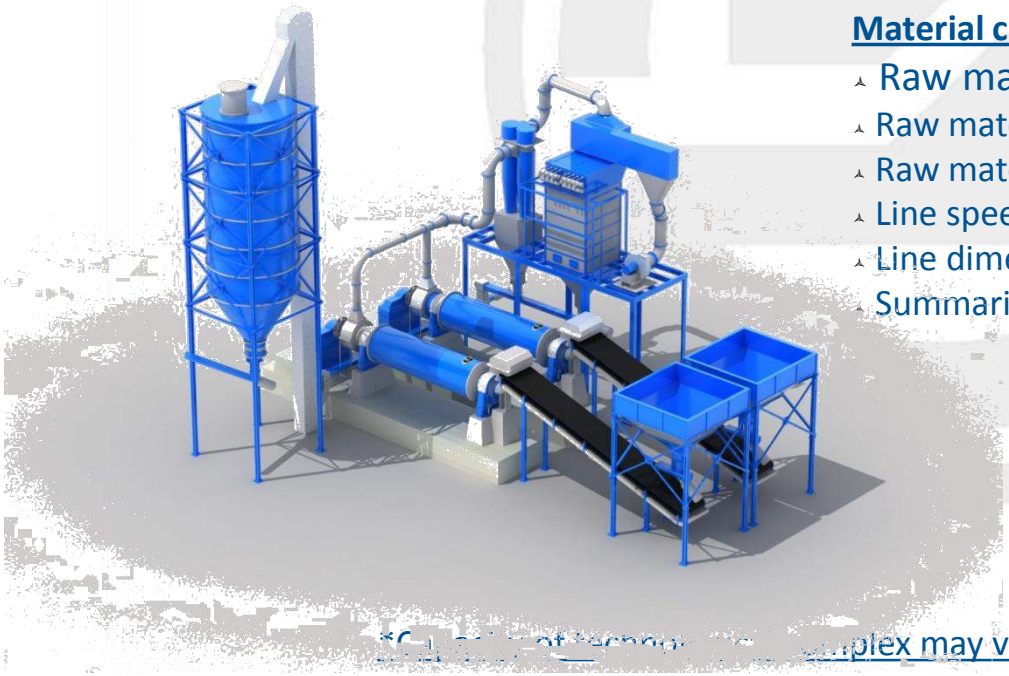
PV 2,5x40 with powdering device (SM 875A)

Capacity, m3/year, keramzit “400”	115000
Kiln casing length, m	40
Inner diameter, m	2,5
Kiln slope, %	3,5
Number of supports, pcs.	2
Type of support bearings	rolling
Kiln mass, t, not above	111
Number of rotations	
a) from main drive, rpm	2,5
b) from auxiliary drive, rpm	3,1
Adjustment range for rotation speed	smooth
Electric motor power	
a) main drive, kW	33
b) auxiliary drive, kW	2,2
Normative document	TU 22-106-61-89

Technological complex for lime, limestone, chalk, concrete-sand mixture, sand, etc. grinding

Process flow diagram

I — material dispersing → II — raw material grinding → III — delivering finished product to the warehouse



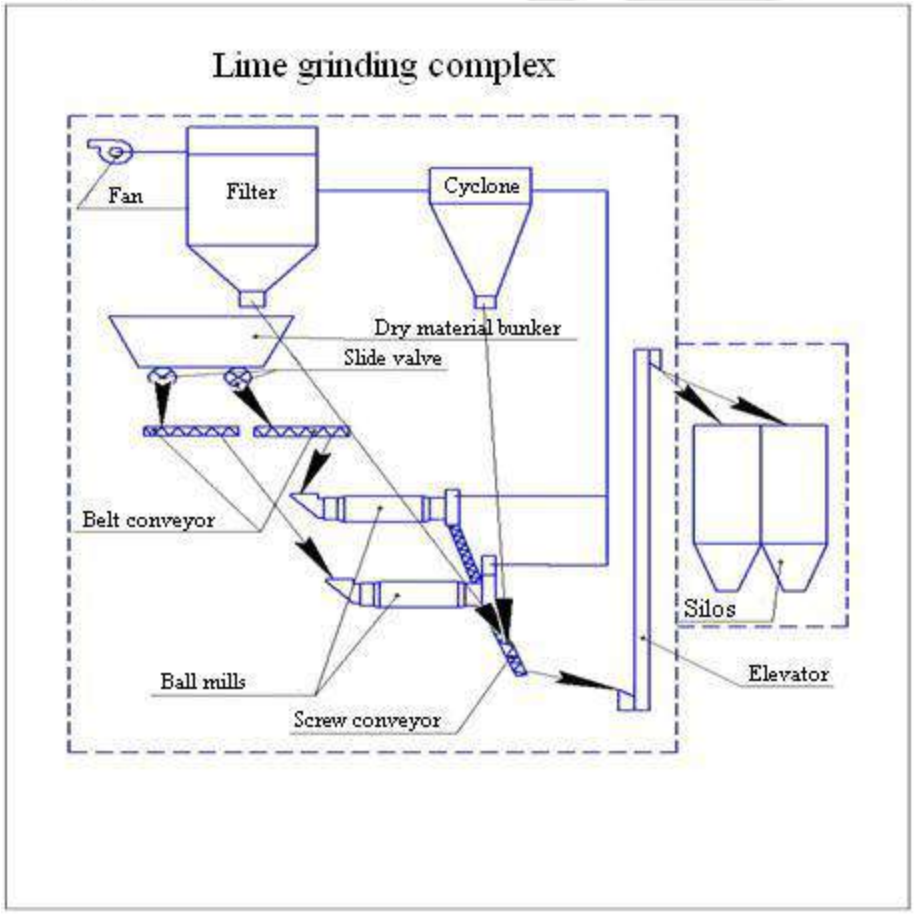
Material characteristics:

- Raw material fractional composition– up to 40 mm
- Raw material moisture – not more than 1%
- Raw material hardness up to 400Pa
- Line speed – 15 tons per hour;*
- Line dimensions (length x width), m – 25x10
- Summarized consumed power – up to 330 kW/hour

*C[illegible]plex may vary and depends on raw material hardness

Technological complex for lime, limestone, chalk, concrete-sand mixture, sand, etc. grinding

Technological diagram



Approximate delivery set

- Initial material hopper (volume - 20 m3)
- Parallel-slide valve (drive type – manual)
- Belt conveyor - 2 sets
- Ball mill 1456 A with set of grinding bodies
- Screw conveyor
- Belt elevator ELG-320, height - 20 m.
- Cyclone CN15.700*2UP
- Sleeve filter SFR 135
- Screw conveyor
- Draught machine VDN-10 (30kW,1500 rpm)
- Silo with systems: aeration; aspiration; control of level and unloading to motor transport (screw), V – 50 m3

Technological complex for limestone, chalk, clay, sand, etc. drying

Process flow diagram

I — material dispersing → II — raw material drying → III — delivering finished product to the warehouse

Material characteristics:

Fractional composition of initial material – up to 40 mm

Initial surface moisture of raw material – not above 15%

Moisture in the material body — not above 2,5%

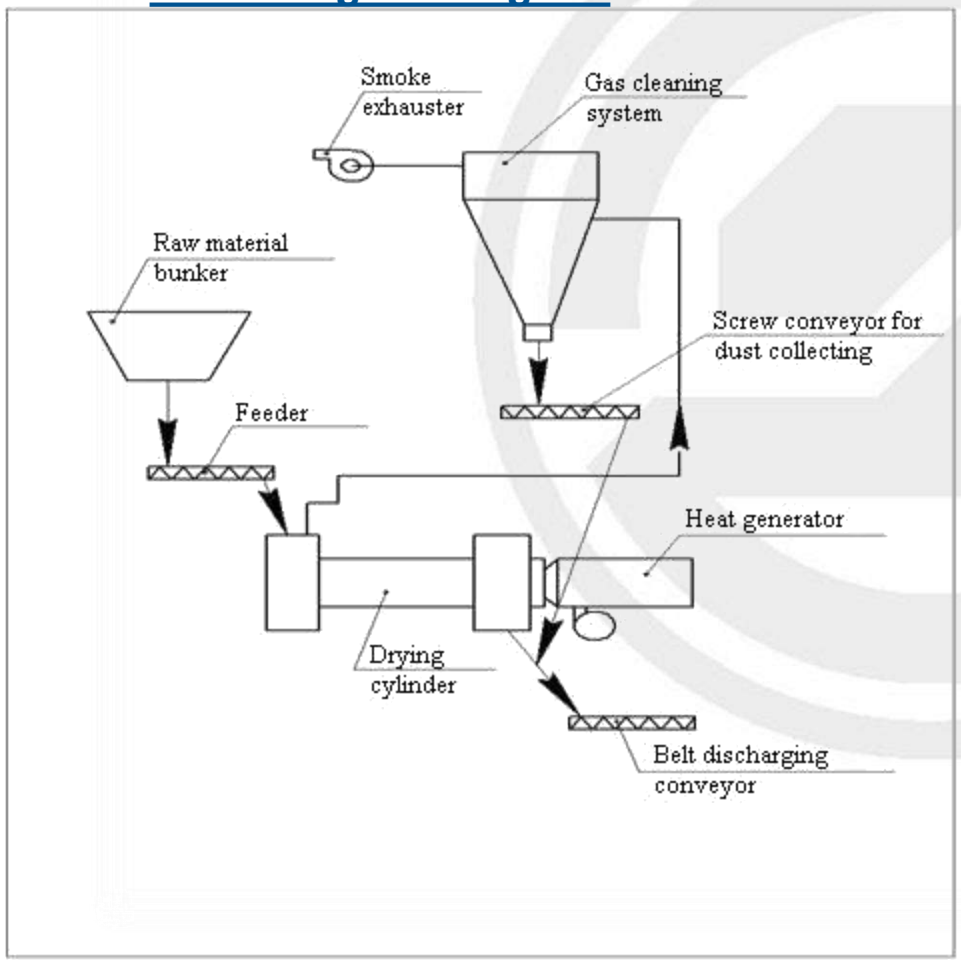
Line capacity – 20 tons per hour (guarantee)*

Line dimensions (length x width), m – 25x10

*Capacity of technological complex may vary and depends on material initial moisture, burner device power and the size of a drying cylinder (diameter from 1,2 to 2,8 m).

Technological complex for limestone, chalk, clay, sand, etc. drying

Technological diagram



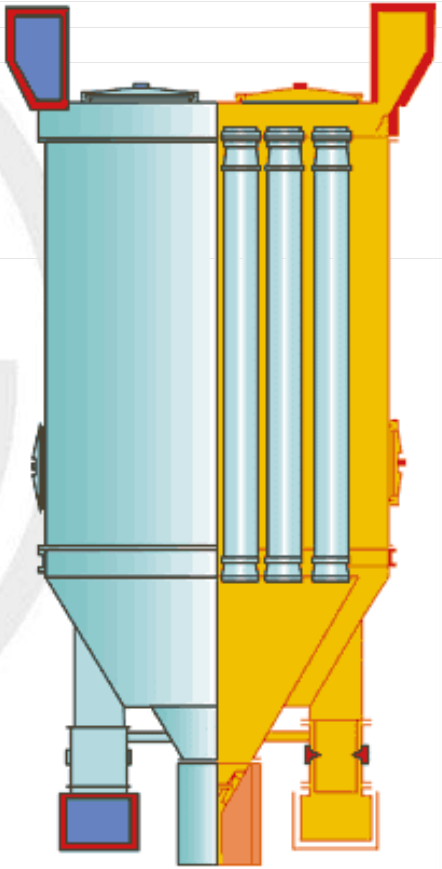
Approximate delivery set:

- Dry material hopper (volume - 10 m3)
- Parallel-slide valve (drive type – manual)
- Plate feeder
- Screw conveyor
- Heat generator (without lining)
- Drying cylinder 2,2x14m
- Belt conveyor with high temperature belt (≈ 200 oC)
- Capacity 20 t/hour
- Cyclone of type CN 15 (cleaning degree 80%)
- Sleeve filter SFR360
- Draught machine DN 12,5
- Elevator and silo (if necessary)

Dust-removing equipment

Sleeve filter SMC166B

Description	SMC 166B
Filter area, m2	30
Filter speed, m/min*	1,2
Capacity, m3/h	2160
Dust content at inlet, g/m3	50
Dust content at outlet, g/m3	0,1
Allowable temperature for gas, oC	140
Air resistance, Pa	1900
Installed power, kW	0,1
Sleeve diameter, mm	200
Number of sleeves, pcs.	24
Compressed air pressure for regeneration, Mpa	0,3-0,6
Overall dimensions (length x width x height), mm	1058x2010x4215
Power voltage, V	380
Weight without electrical equipment, kg, not above	990
Normative document	TU 4841-004-00239468-94 OKP code 484141



*Determined according to dust characteristics at fixing the filter in the processing plant.

Dust-removing equipment

Sleeve filter SMC 169 (NS)

Description	SMC 169 (NS)
Filter area, m2	10
Filter speed, m/min*	1,2
Capacity, m3/h	720
Dust content at inlet, g/m3	50
Dust content at outlet, g/m3	0,08
Allowable temperature for gas, oC	140
Air resistance, Pa	1900
Installed power, kW	0,04
Sleeve diameter, mm	200
Number of sleeves, pcs.	12
Compressed air pressure for regeneration, Mpa	0,3-0,6
Overall dimensions (length x width x height), mm	1090x975x1795
Power voltage, V	380
Weight without electrical equipment, kg, not above	220
Normative document	TU 4841-004-00239468-94 OKP code 484141

Determined according to dust characteristics at fixing the filter in the processing plant.

Dust-removing equipment

Sleeve filter SFR

Main advantages of sleeve filter SFR:

- Filtering area increased from 90 to 540 m2
- For effective maintenance of sleeve filters the design is equipped with stairs
- Use of effective regeneration methods for filter sleeve, control electronic systems and regeneration control
- Operative delivery of high-wearing repair parts

Modern device control electronic system provides the following:

- Regeneration sleeves control upon the algorithm set
- Gas temperature control at filter inlet (additional option)
- Connection with Automatic Process Control System of upper level
- Emergency signal in case of troubles

Dust-removing equipment

Sleeve filter SFR

Description	SFR 90	SFR 135	SFR 180	SFR 270	SFR 360	SFR 405	SFR 540
Number of filters SMC 40B3, pcs.	1	1,5	2	3	4	4,5	6
ПFilter area, m2, not less	90	135	180	270	360	405	540
Design capacity on clean gas at filter speed 1,5 m/min, m3/h	8100	12150	16200	24300	32400	36450	48600
Filter speed within limits, m/min	from 1,2 to 1,8						
Dust concentration at filter inlet, g/m3	100						
Dust concentration at filter outlet, g/m3	0,05						
Number of filter sleeves, pcs.	81	81	81	162	162	273	273
Number of impulse valves with electromagnet drive	9	9	9	18	18	27	27
Negative pressure in filter, Pa, not abov	3500						
Air pressure for regeneration, mPa	from 0,4 to 0,8						
Overall dimensions, mm, not more							
Length	4800 (3000)						
Width	2255 (2255)			4510 (4510)		6765 (6765)	
Height	7430 (4800)	8200 (5650)	9000 (6500)	8200 (5650)	9000 (6500)	8200 (5650)	9000 (6500)
Mass, t, not above	3,45 (2.23)	3,9 (2,7)	4,35 (3,1)	7,8 (5,4)	8,7 (6,1)	11,7 (8,1)	13.05 (9,2)

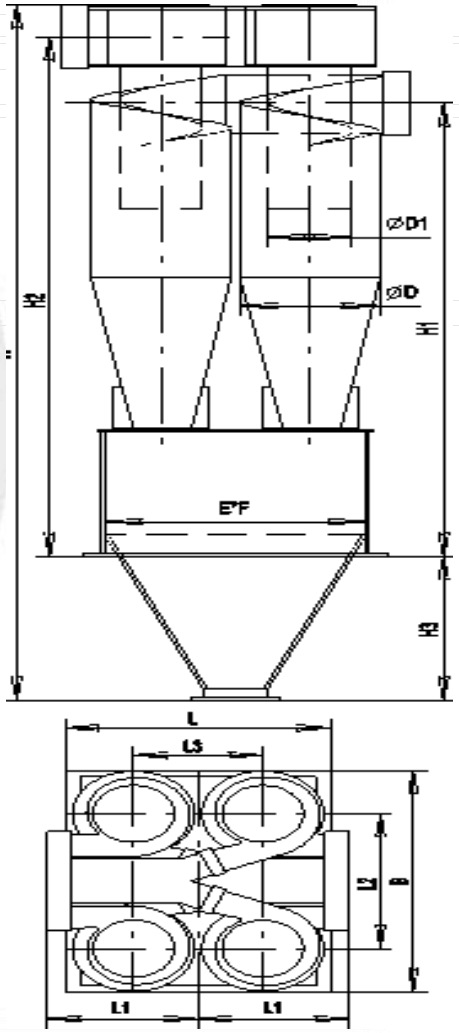
Cyclones CN15.4UP

Dust-removing equipment

Description	400-4	500-4	600-4	700-4	800-4	900-4
Capacity, m3/hour, at w=2,5 m/s	4500	7000	10200	13800	18100	22800
Capacity, m3/hour, at w=4 m/s	7200	11300	16300	22000	28900	36600
Weight, kg	820	1190	1650	2160	2800	3510
Hopper operating volume, m3	0,54	0,77	1,11	1,5	2,27	2,28

Main installation dimensions

	400-4	500-4	600-4	700-4	800-4	900-4
D	400	500	600	700	800	900
D1	230	290	350	410	470	530
H	3450	4166	4882	5588	6304	7010
H1	2312	2715	3120	3512	4015	4408
H2	660	3110	3593	4066	4649	5122
H3	1170	860	1060	1260	1360	1560
B	1006	1330	1605	1855	2070	2324
L	510	1110	1335	1490	1705	1904
L1	510	630	740	850	960	1070
E	800	950	1150	1300	1500	1700
F	1000	1200	1450	1700	1900	2150



Grinding equipment

Ball mill 1456A

Mill type	Ball, two-chamber
Mill index	1456A
Rated drum working volume, m3	8
Drum inner diameter without lining, mm	1512
Drum length, mm	5600
Rotation frequency of the mill, rpm.	29
Capacity, t/h	2-8
Overall dimensions (length x width x height), mm	12000x2600x2300
Mill weight with grinding bodies, kg	38530
Maximum weight of grinding bodies, kg *	11000
Installed power of electric motor, kW	132
Rotation frequency of electric motor, rpm.	730
Supply voltage, V	380
Reduction ratio	25
TU 4844-002-54028 986-2003 OKP code 484421	

Ball mill MShC 1500X3000 (SM6001A)

Mill type	MShC
Mill index	SM6001A
Rated drum working volume, m3	4,2
Drum inner diameter without lining, mm	1500
Drum length, mm	3100
Rotation frequency of the mill, rpm.	28
Capacity, t/h	4,2-12,0
Overall dimensions (length x width x height), mm	6300x3600x2600
Mill weight without grinding bodies, t	23
Weight of grinding bodies, t	10,5
Installed power, kW	90
Rotation frequency, rpm.	1480
Reduction ratio	12,5
TU 4844-003-54028 986-2003 OKP code 484421	

* Grinding bodies are supplied separately.

Grinding equipment

Ball mill MshR 1500X1600 (SM6003A)

Mill type	MShC
Mill index	SM6003A
Rated drum working volume, m3	4,2
Drum inner diameter without lining, mm	1500
Drum length, mm	1670
Rotation frequency of the mill, rpm.	28
Capacity, t/h	0,5-3,0
Overall dimensions (length x width x height), mm	4900x3300x2500
Mill weight without grinding bodies, t	16,5
Weight of grinding bodies, t	4,8
Installed power, kW	55
Rotation frequency, rpm.	1480
Reduction ratio	12,5
TU 4844-003-54028 986-2003 OKP code 484421	

Ball mill MshR 1500X1600 (SM6004A)

Mill type	MShC
Mill index	SM6004A
Rated drum working volume, m3	2,2
Drum inner diameter without lining, mm	1500
Drum length, mm	1670
Rotation frequency of the mill, rpm.	28
Capacity, t/h	0,5-3,0
Overall dimensions (length x width x height), mm	4900x3300x2500
Mill weight without grinding bodies, t	16,5
Weight of grinding bodies, t	4,8
Installed power, kW	55
Rotation frequency, rpm.	1480
Reduction ratio	12,5
TU 4844-003-54028 986-2003 OKP code 484421	

* Grinding bodies are supplied separately.

Grinding equipment

Ball mill MShC 900X1800 (SM 6007A)

Mill type	MShC
Mill index	SM6007A
Rated drum working volume, m3	0,9
Drum inner diameter without lining, mm	900
Drum length, mm	1860
Rotation frequency of the mill, rpm.	37
Capacity, t/h	0,7-2
Overall dimensions (length x width x height), mm	5400x2200x1600
Mill weight without grinding bodies, t	5,2
Weight of grinding bodies, t	1,7
Installed power, kW	22
Rotation frequency, rpm.	730
Supply voltage, V	380
Reduction ratio	12,5
TU 4844-003-54028 986-2003 OKP code 484421	

Ball mill MShC SM6008A

Mill type	MShC
Mill index	SM6008A
Rated drum working volume, m3	0,9
Drum inner diameter without lining, mm	900
Drum length, mm	1900
Rotation frequency of the mill, rpm.	37
Capacity, t/h	0,2-1,2
Overall dimensions (length x width x height), mm	5320x1190x1035
Mill weight without grinding bodies, t	3,95
Weight of grinding bodies, t	1,7
Installed power, kW	18,5
Rotation frequency, rpm.	730
Reduction ratio	20
TU 4844-003-54028 986-2003 OKP code 484421	

* Grinding bodies are supplied separately.

Grinding equipment

Rod mill MSC 1500X3000 (SM6002A)

Mill type	MShC
Mill index	SM6001A
Rated drum working volume, m3	4,2
Drum inner diameter without lining, mm	1500
Drum length, mm	3100
Rotation frequency of the mill, rpm.	25
Capacity, t/h	10-18
Overall dimensions (length x width x height), mm	6300x3500x2500
Mill weight without grinding bodies, t	21
Weight of grinding bodies, t	10,5
Installed power, kW	90
Rotation frequency, rpm.	1480
Reduction ratio	12,5
TU 4844-003-54028 986-2003 OKP code 484421	

Rod mill MShC 900X1800 (SM 6005A)

Mill type	MShC
Mill index	SM6005A
Rated drum working volume, m3	0,9
Drum inner diameter without lining, mm	900
Drum length, mm	1860
Rotation frequency of the mill, rpm.	30
Capacity, t/h	2-4
Overall dimensions (length x width x height), mm	3850x2200x1600
Mill weight without grinding bodies, t	5,2
Weight of grinding bodies, t	2,3
Installed power, kW	22
Rotation frequency, rpm.	1480
Supply voltage, V	380
Reduction ratio	10
TU 4844-003-54028 986-2003 OKP code 484421	

* Grinding bodies are supplied separately.

Gypsum industry equipment

Classification of processing schemes for gypsum binding materials production under the conditions of raw material heat treatment conditions

Scheme name	Type of binding material received	Equipment for heat treatment
	I group	
Schemes with heat mechanisms connected with outer atmosphere	Binding materials included in the group of construction gypsum, i.e. consisting mainly of β-calcium sulfate semihydrate	1. devices of indirect material heating: • kettles • rotating furnaces with outer heating-up 2. Devices with direct contact of fired material with furnace gases: • rotating furnaces with gas pass through the drum cavity • Devices for raw material firing in weight condition (paddle-type mill , pit and ball mills of combined milling and firing)
	II group	
Schemes with air proof devices operating under pressure	Binding material, consisting mainly of α-calcium sulfate semihydrate (high-impact gypsum)	• Autoclaves • Self-steam chamber • dampers
	III group	
Schemes with devices for doublehydrate dehydratation in liquid spheres	Binding material, consisting mainly of α-calcium sulfate semihydrate (high-impact gypsum)	• boilers (reactors)

We offer various equipment for supply according to any of the aforementioned processing schemes as well as spare parts

Main fields of gypsum using

- Dry building mixes manufacturing
- Building materials manufacturing
- Construction companies
- Private persons

Selection of processing schemes for production of gypsum binding materials depends on various factors: volume of production, raw material characteristics, required qualities of binding materials, etc.

Physicotechnical properties of gypsum and anhydrite

Properties	Gypsum	Anhydrite
true density, g/cm3	2,32	2,89
Mohs' hardness	1,5…2,0	3,0…3,5
Breaking strength , MPa: under compression under tension	 17 2	 80 7
Fragility coefficient	8,5	11
Melting temperature	1450	1450

Gypsum binder manufacturing technological complex

Raw material	gypsum rock up to 500 mm
Production scheme	**Schemes with heat mechanisms connected with outer atmosphere**
Equipment for heat treatment	Kettles, rotating furnaces, drying cylinders
Complex capacity, t/h	Up to 10
Complex capacity, t/year	Up to 40000
Annual raw material consumption, t/year	Up to 50000
Finished product	Binding materials included in the group of construction gypsum, i.e. consisting mainly of β-calcium sulfate semihydrate, construction gypsum G-2...G-5 class of coarse, middle and fine grinding
Fuel consumption rate, m3/h	250-300
Installed complex power, kWt, not above	370
Weight, t, not above	75
Complex area, m2	360
Complex lenght, m	30
Complex widht m	12
Complex hight, m	15

Manufacturing technique of gypsum plaster

Manufacturing technique of gypsum plaster using drying cylinders

Stages

I — raw material crushing → II — raw material drying → III — raw material grinding

Manufacturing technique of gypsum plaster based on kettles

Stages

I — raw material crushing → II — raw material drying and grinding → III – firing of gypsum meal

Modern gypsum binding productions are effected under similar processing schemes, however preferably for transportation of granular and dust materials the pneumatic conveying systems are used.

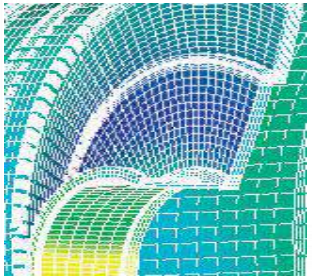
Development by means of new equipment and technics of grinding and drying exploration

Engineering

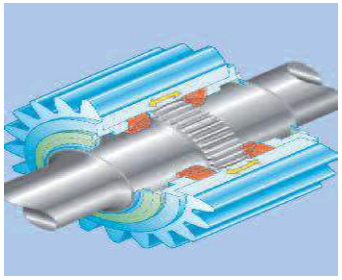
Our **main target** in engineering is implementation of modern equipment for effective optimization and improvement of production quality.

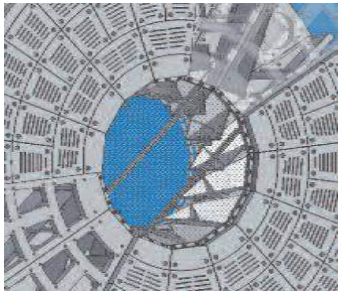
DASSAULT SYSTEMES

Use of multipurpose finite-element computing program systems ANSYS for solving the linear, nonlinear, stationary and non-stationary spatial problems of deformable body mechanics and structural mechanics, including construction unit contact interaction and also application of Dassault Systems CATIA company CAD system (computer-aided design system) with third-party experts and institutes involving, allowed:



- **to apply techniques for developing the new and non-standard equipment;;**
- **considerably accelerate technical documentation development;**
- **to analyze modeled applied technology and borrowed nodes of grinding and drying standard components using possibility;**
- **to make strength analysis in rotational dynamics on-loading (including material).**

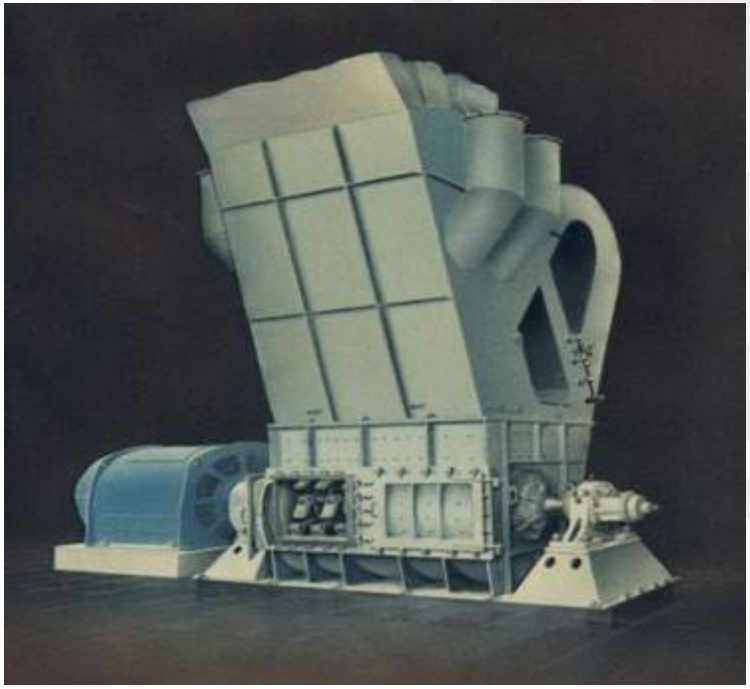




Hammer tangential mill with simultaneous material drying

Stages of ssuggested process:

I — material dispersing → I I — drying, grinding and separation in one unit



Material characteristacs:

- Fractional composition of initial material – up to 40 mm
- Moisture of raw material – not above 15%
- Material strenght up to 400 Pa
- Capacity — up to 60 tonne per hour

Size (lenght x width x hight) — 4,4x3,7x 1,9 m

- Total power demend — up to 1000 kWt/hour

One chamber ball mills of increased output

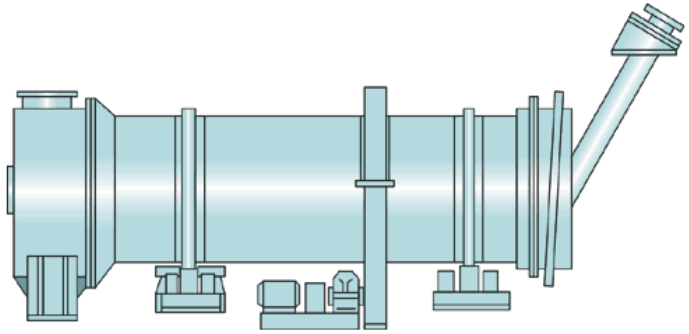
ANSYS Complex was firstly used in sizing the mills with extended drum lenght up to 7,1 m when CJSC «Koyelgamramor» delivered

Technical characteristics:

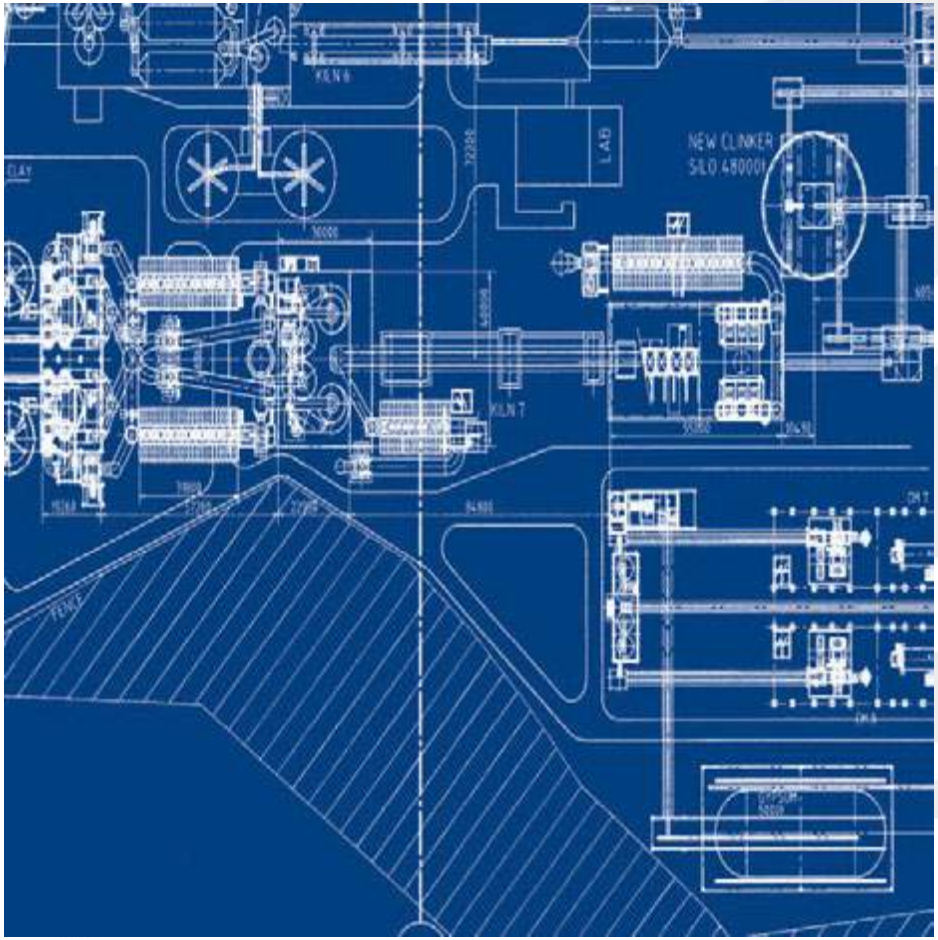
Mill type — Ball, two-chamber	
Mill index	**1471**
Rated drum working volume	**10,6m3**
Drum inner diameter without lining	**1512mm**
Drum length	**7100mm**
Rotation frequency of the mill, rpm.	**29**
Capacity, t/h	**10-12**
Mill weight with grinding bodies, kg	**45530**
Maximum weight of grinding bodies, k	**15000**
Installed power of electric motor, kW	**132**
Rotation frequency of electric motor, rp	**730**
Supply voltage, V	**380**

Drying cylinder 3,5x27 m

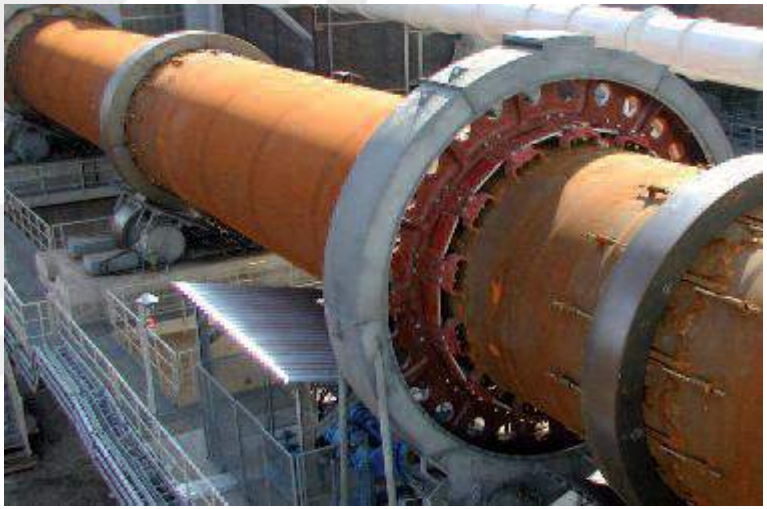
Name	Drying cylinder 3,5x27 m
Type	Sequenced-flow
Mode of operation	Continuous
Drum casing size (diameter x length), mm	3500x27000
Drum volume, m3	250
Drum casing incline towards the horizon, degree.	3
Installed power, kW	120
Mass, kg	200



Drying cylinder of small diameter 1,0; 1,2; 1,6 m



On the basis of use of modern program products on the grinding equipment and large drying drums all dryers of small diameters were processed. That allowed to reduce prime cost and to establish competitive one.



Testimonials

CLOSED JOINT-STOCK COMPANY
"KOELGAMRAMOR"

Ref. No.: 3353 Ilyas 23.05.2012

Dear Leonid Alexandrovich!

In accordance with your request I hereby inform you that since 2006 year for uninterruptable production we make use of ball mill in quantity of " units manufactured by the Samara plant "Strommashina".

During years indexes of operation and expenses of a ball mill placed in operation in 2006:

Item	Index	Units	Value
	Continuous work time	Hour/year	7500hours/year
	Input fraction size	Max	0-13mm; 10-20mm
	Output fraction size	Min	0+0.3mm
	Product hardness	on the Mohs scale	3
	Grinding media consumption	Kg/t (charging feed)	acceptable not
	Lining wear	Kg/t (charging feed)	acceptable not
	Average scheduled preventive maintenance time (with planned shutdowns)	Hour/month	2 hours/month

Considering that as of from 2006 to 2012 years grinding media and liner have light wear, consumable products costs (without including grinding) per ton of the processed feed material are absent.

Chief technology
CJSC "Koelgamramor" Rachok A.O.

530

TIKKURILA

Ref.: 023-12.11 Date: 27.12.2011

For the attention of Nesterov Alexander Nikolaevich
Assistant general marketing director
Trading house Stroydetalmash CJSC, Samara

Dear Alexander Nikolaevich,

In compliance with your request hereby represent and warrant that purchase production of the Ecolgamramor JSC throughout the 2010 and 2011 years - EM- 5 and EM-100 crushed marble, produced on the milling and drying equipment, manufactured by the Samara plant "Strommashina", doesn't revise concrete with performance specification at the stage of the initial check and point, vacuum and hopper production on humidity parameters and parameters of the granulation. The above production parameters consistently provided by the quality management system and manufacturing capabilities of the producer within the scope of the declared technical specifications.

Sincerely,
Alexander Hromchuk
Procurement director, TIKKURILA LLC
Pillow category manager, Tikkurila group

LLC ""EKOTERRA"

Kazakhstan, 130001, Aktau, 2 Marta Str., 16/1
Tel/fax: (7292) 55-82-48; TIN 4301002523872
a/c: 000467444 in JSC "ATF Bank" RCBIC 190201944

To whom it may concern

LETTER OF RECOMMENDATION FOR A PERFORMANCE EVALUATION OF THE SAMARA PLANT "STROMMASHINA"

Construction of the drilling waste management complex is one of the major commercial capital investment projects, implemented by the «Ecoterra» LLP in Kazakhstan Aktau city.

From the march 2010 till now Samara plant "Strommashina" takes part in capital investment project implementation on construction of the drilling waste management complex as a manufacturer, equipment supplier and designer.

Complex consist of: drilled cuttings charging carrot, drilled cuttings drying, separation block of the four drums and consolidated control room, control system.

During the construction of the project the following work scope completed:
- manufacturing and supply of the equipment
- design works

All documentation required for associated works execution (piling, finishing work, installation and wiring work, insulation work, instrumentation and controls and so on) needed to facility commissioning is available.

Using one's own resources plant carries out work on foundation blocks and metal structures erection supervision, processing equipment.

Contract price of the complex amounted to about 20 million rubles.

Drilling erection base from the beginning of the ground preparation to the start-up of a project are about 24 months at the normative period of the similar objects construction 36 months.

In June 2011 acceptance committee accepts into service the drilling waste management complex.

The Samara plant "Strommashina" performance indicator were achieved due to clear organizational system, highly knowledgeable qualified personnel.

Upon completion construction and installation activities Samara plant "Strommashina" will be integral to individual tests, comprehensive testing, as well as pre-commissioning procedures.

Commissioning of the drilling waste management complex will allow «Ecoterra» LLP serve to providing new up-to-date services Kazakhstan oil and gas complex, complying with a highest European standards, to increase the output of the advanced oil processing products and significantly improve the ecological situation in a region.

Chief technology officer Alirz I.A.

Thank you for your attention!