



# Siberian Lining Company LLC.

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Customized approach

Quality guarantee

Compliance with deadlines

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# About company

Siberian lining company LLC. (Novosibirsk, Russia) is one of the leading companies in the field of complex lining solutions for protection of the working surfaces of process and transport equipment used in mining industry from abrasive and corrosive wear, and in supplies of accessories for conveyor equipment, that increase its efficiency.

- Application of advanced lining materials increases the service life of the main equipment and its lined elements without replacement and reduces the equipment downtime due to the increase in overhaul cycles.
- Installation of additional accessories on the conveyor equipment allows to increase the efficiency and productivity of the installed equipment and facilitate operation of the mining and processing equipment.

## WHY CHOOSE US



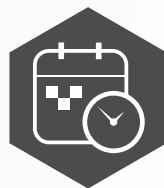
Quality guarantee



Advanced technologies



«Turn-key» service



Compliance with deadlines



Stock availability



Direct supply from the manufacturer





# Products

## High quality ceramic lining elements on the base of alumina ceramics (Al<sub>2</sub>O<sub>3</sub>)



Wear-resistant elements prevent destruction in the transportation, processing, mining and other technological equipment. The elements are made of high-purity, finely dispersed, alpha-alumina. Wear-resistant plates can be made from a variety pre-designed element of different dimensions and forms.

### Fixation system

Cylindrical and shaped parts, tiles and other elements can be laid in the required geometry and fixed by adhesive on an epoxy base or by welding (electric socket through the hole).

### Advantages

High wear resistance, hardness, smooth surface, does not corrode, inertness to aggressive media, heat resistance, minimum thickness is up to 3 mm.

### Temperature of application

Up to 1000 °C depending on application, fixation system and geometry.

### Physical properties

No	Parameter	Unit	92%	95%
1	Al <sub>2</sub> O <sub>3</sub>	%	92.14	95.38
2	Density	g/sm <sup>3</sup>	3.60-3.62	3.66-3.68
3	Vicker's hardness HV50	MPa	1050	1250
4	Crack resistance	MPa*m <sup>1/2</sup>	3.5	4.8
5	Water absorption	NO	NO	NO
6	Gases absorption	NO	NO	NO
7	Particle dimension (equivalent diameter)	µm	3.5	3.2



## Products



### Standard ceramic tiles

Standard ceramic tiles are used for protection against wear, especially on the flat and straight-line surfaces. Special sizes are on the Customer's request.



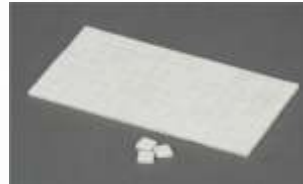
### Welding ceramic tiles

Welding tiles have a hole, and complete with carbon steel riveting and a ceramic plug for welding.



### Ceramic mosaic

Ceramic mosaic is widely used as a lining (facing) tile in the conveyor equipment to protect the drive pulleys of belt conveyors from wear, increases the tape engagement ratio, excluding its slippage.



### Mosaic mats

The mosaic mats consist of small mosaic tiles glued to acetate silk or PVC mounting film. Standard mats are 250x250 and 500x500 mm. Standard thickness is 3-12 mm. The mats consist of a square tile of 10x10 or 20x20 mm, or a hexagonal tile of SW20 mm. Special sizes are on the Customer's request.



### Ceramic tubes

Cylinders and spherical segments provide solid protection for steel pipes from abrasive and corrosion wear, even with a small wall thickness. Standard dimensions of inner diameter are 40-500 mm. Special sizes are on the Customer's request.



### Polishing balls

Wear resistant polishing and grinding balls with a high content of alumina are used in ball mills to produce fine and super-fine grinding in the chemical, biochemical, pharmaceutical, and mining industries. Special sizes are on the Customer's request.



### Zirconium ceramics

The combination of aluminum oxide and zirconium dioxide (ZTA) increases strength, toughness, hardness and wear resistance in 20-30% in comparison with pure alumina ceramics. The maximum temperature for application of products from ZTA ceramics is 1450 ° C.



### Customized elements

It is possible to design and manufacture a comprehensive wear-resistant protection and to adapt protective schemes for the Customer's tasks. Special processing of products prior to sintering allows to manufacture products of complex three-dimensional shape.



# Rubber-ceramic mounting sheets

## Product description

The sheets are a wear resistant nano-sized rubber film with 92% alumina ceramics and CN layer, prepared for easy deformation during installation.



## Application

Soft mining of earth's formations and gravel.

## Parameters

High wear resistance when working with sliding and high-speed materials, especially where the material has a small impact angle. The best efficiency is in the range of temperatures - 30°C/+ 70°C.

## Standard sizes

500x500x8 mm (ceramic tile 10x10x5 mm)

500x500x8 mm (ceramic tile 20x20x5 mm)

## Fixation scheme

### Surface preparation

1. The metal surface must be free of dirt, rust and other deposits. The best way is sandblasting the surface or to use a grinder.
2. Grease the metal surface with a solvent.

### Gluing stages

1. Apply glue to a metal surface and allow to dry for 30 minutes.
2. Apply glue to surface of the contact layer of the mounting sheet and allow it to dry for 30 minutes.
3. Apply a second layer of glue to the metal surface.
4. Apply a second layer of glue to the contact surface of the mounting sheet.
5. Connect the surfaces.
6. Make sure that all air bubbles are removed. Use a roller and hammer without recoil. The withdrawal of bubbles start in the middle and lead to the edges.



**NOTE!** Maximum adhesive strength is achieved after 24 hours

# Rubber-ceramic plates

## Product description

Lining rubber-ceramic plates are manufactured from high quality wear resistant rubber with alumina ceramics 92% and 95% and with fixed cured steel substrate.

## Parameters

Excellent protection against abrasive wear with the ability to use plates in conditions of high-speed impact of the material particles. It provides reliable protection at various angles of the material impact. The steel substrate provides reliable fixation.

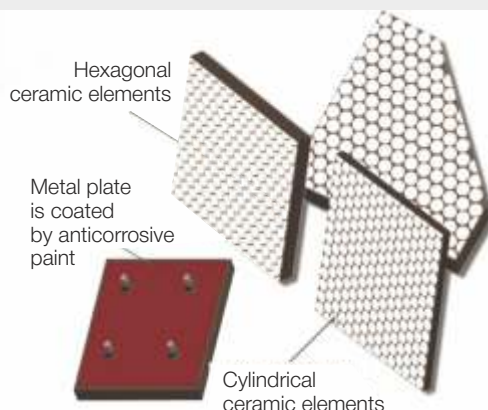
## Application

Middle and heavy mining and processing industries (mining and processing of various rocks of small, medium and large fractions), protection of equipment against abrasive wear during transportation of material in large volumes and at high flow rates. It is used at transfer points in conveyor systems, as well as material deflectors and screening trays.

**NOTE!** The best efficiency is in the range of temperatures - 30°C / + 70°C.

## Standard sizes

- 500x500x20 mm (square 48x48x10 mm, hexagon 20x20x10 mm, cylinder D=25x10 mm)
- 300x300x20 mm (square 48x48x10 mm, hexagon 20x20x10 mm, cylinder D=25x10 mm)
- 500x500x32 mm (square 48x48x20 mm, hexagon 20x20x20 mm, cylinder D=25x20 mm)
- 500x500x37mm (square 48x48x20 mm, hexagon 20x20x20 mm, cylinder D=25x20 mm)
- 300x300x37mm (square 48x48x20 mm, hexagon 20x20x20 mm, cylinder D=25x20 mm)



## Fixation modes



Threaded bolt M16

## Clear illustration



Rubber-ceramic plates with thickness 32 mm

Loading chute

## Lining of bunker







# Rubber-ceramic plates (enhanced)

## Product description

Plates are manufactured from high quality wear resistant rubber with alumina ceramics 92% and 95% and with fixed cured steel substrate.

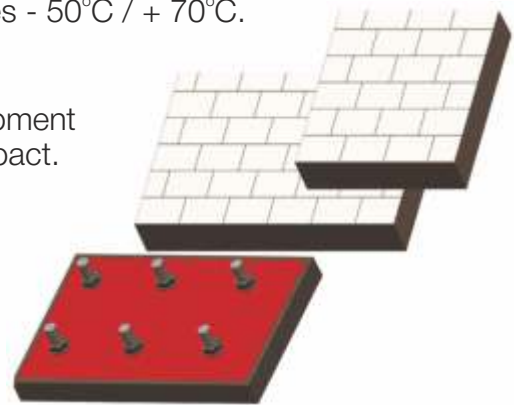
### Parameters

Unique constructive form of ceramic elements and a special zigzag structure.

**NOTE!** The best efficiency is in the range of temperatures - 50°C / + 70°C.

### Application

Heavy mining industry. It provides protection of the equipment when handling large volumes of material and angular impact.



### Standard sizes

500x500x63 mm (ceramic tile 50x50x50 mm)

300x300x63 mm (ceramic tile 50x50x50 mm)

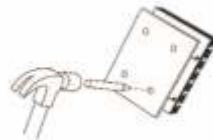
500x250x63 mm (ceramic tile 50x50x50 mm)

## Installation instruction

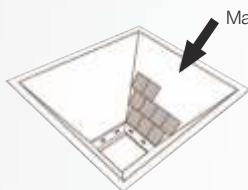


Material's flow

Ceramic tiles should be installed in the form of zigzag against flow



1. Strike the center of marking
2. Clean all rust around marking, etc.



Material's flow

Plates should be installed in such a way that zigzag drawing is against flow, as indicated in the picture



3. Weld studs with a welding machine

## Installation examples



Chute



Conveyor

# Rubber-ceramic lining of belt conveyor pulleys

## Product description

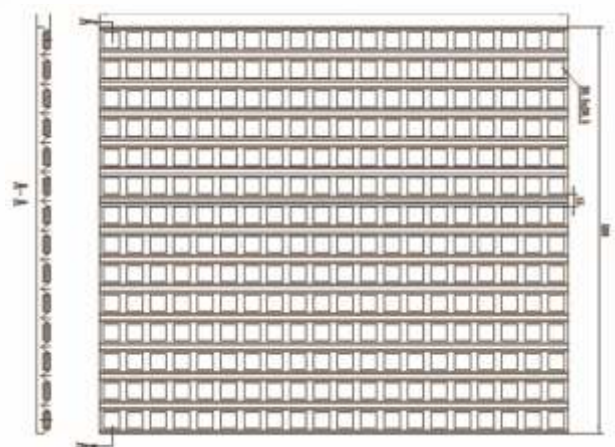
Rubber-ceramic lining provides durable life cycle of pulley, allows to avoid belt slippage, decreases out-of-service time, increases durability of lining and pulley in conditions of high pollution and dampness.

### Parameters

The rubber-ceramic lining of pulley is particularly suitable in cases where slippage and excessive wear make normal rubber lining ineffective. Alumina ceramics tiles allow to maintain the correct position of the belt, even in conditions of high humidity, heavy pollution and abrasive impact. Also, by varying the thickness of the ceramic elements and the total thickness of the lining, it is possible to compensate the difference in diameters of the pulleys.

**NOTE!** The best efficiency is in the range of temperatures - 30°C/+ 70°C.

### Ceramic elements arrangement



### Standard sizes

- 500x500x16 mm (ceramic tile 20x20x8 mm)
- 500x600x16 mm (ceramic tile 20x20x8 mm)
- 1400x200x16 mm (ceramic tile 20x20x8 mm)
- 1600x200x16 mm (ceramic tile 20x20x8 mm)

### Fixation modes

Mode of cold curing (special structural adhesive)

### External view





# Replaceable lining of belt conveyor pulleys

## Product description

Replaceable Slide-Lag and Bolt-On lining plates for pulleys are easily and quickly removed and installed, perfect for pulleys installed in hard-to-reach places where dismantling is very difficult due to the drive mechanism, partitions or high position.

## Parameters

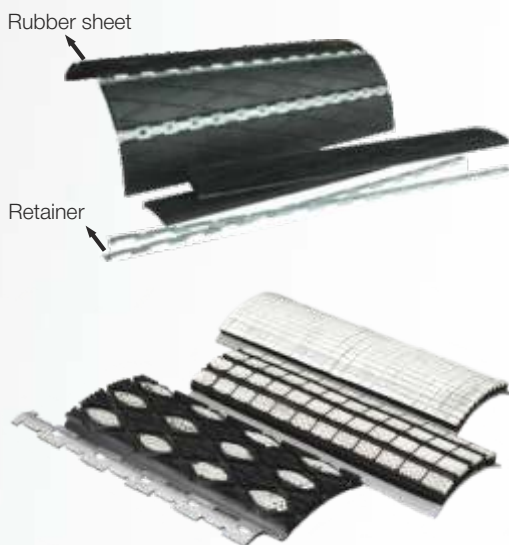
Replaceable lining plates are manufactured from special wear resistant rubber, fully vulcanized under high pressure on the steel frame, which is bent beforehand to the diameter of the pulley. It neutralizes the internal stresses in the patch and gives the maximum adhesion of the rubber to the metal. The usage of rubber with high density ensures a long service life. The locking plates are also made of steel; therefore, the installed plates are firmly fixed on the surface of the pulley. Replaceable pulley lining can also be produced with ceramic elements instead of diamond pattern.

### A. Rubber:

1. Material: NR&BR
2. Density: 1.15 g/sm<sup>3</sup>
3. Tensile strength: 24 MPa
4. Shore hardness: 65±5
5. Elongation: 500%
6. Wear lost: 85 mm<sup>3</sup>
7. Ageing coefficient:  
0.87 (70C°x48 hours)

### B. Alumina ceramics:

1. Material: Al<sub>2</sub>O<sub>3</sub> ≥92-95%
2. Density: 3.6 g/sm<sup>3</sup>
3. Colour: wight
4. Wear lost: <0.093
5. Hardness: 9 (Mohs)



**Slide-Lag replaceable lining**



**Bolt-On replaceable lining**



# Ceramic lining of belt conveyor pulleys

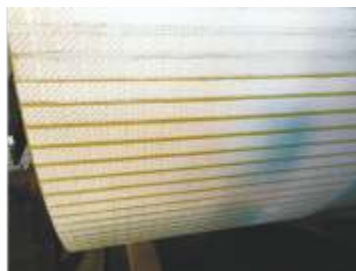
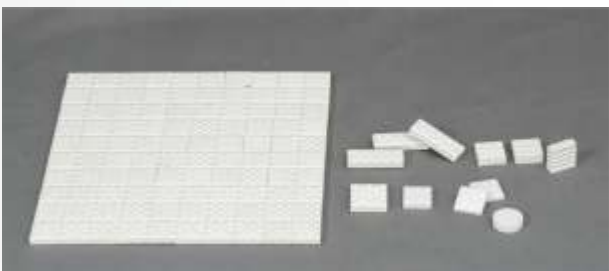
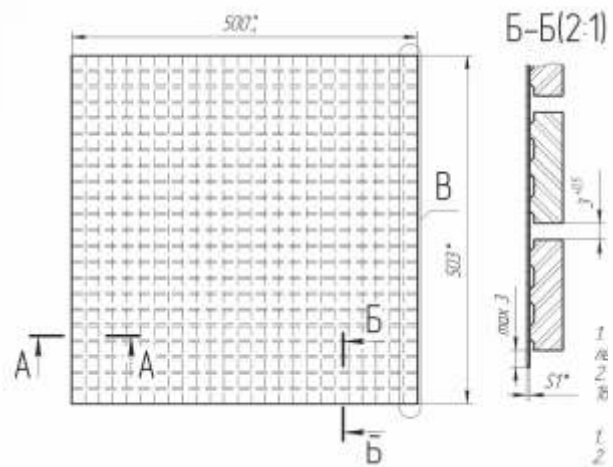
## Product description

Wear resistant ceramic elements from alumina 92-95% can be fit into the required geometry and be fasten with adhesive on epoxy resin base. The special geometry of ceramic elements prevents slipping of the conveyor belt during operation.

### Parameters

Alumina ceramic elements have high wear resistance, hardness, heat resistance, inertness to aggressive media, do not corrode. The usage of this type of lining eliminates slippage of the conveyor, increases the service life and performance of equipment, reduces operating costs. There is no need to increase the load to maintain adhesion in high humidity. Reducing the belt tension increases its service life. Ceramic tile teeth have rounded edges that prevent damage of the belt. It Improves drainage of water and dirt from the surface of the pulley, the conveyor mileage. This type of lining can be washed with water from a hose without losing the quality of adhesion.

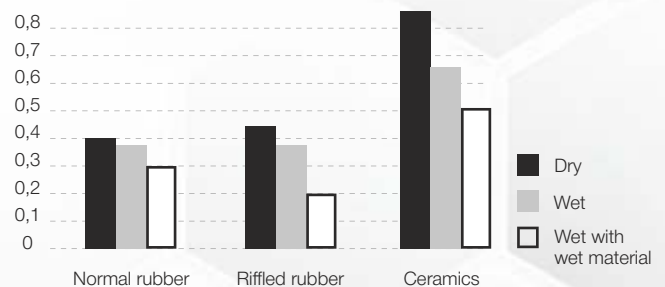
**Application temperature:** up to 200 ° C, depending on the application, fixing mode and geometry.



### Life cycle of pulleys after lining:

- Steel lining: from **1 to 5 years** depending on the operating conditions;
- Rubber: from **3 to 7 years** depending on the operating conditions;
- Ceramics: up to **20 years**.

### Diagram of wear indexes for pulleys





# Pipelines, pipe branches and fittings with ceramic lining

Siberian Lining Company LLC. manufactures and supplies wear-resistant pipelines with lining based on Al<sub>2</sub>O<sub>3</sub> ceramics in accordance with individual equipment projects, their functions and operating parameters. To achieve technical protection against abrasive wear and high economic performance, many factors must be taken into account. Extending the service life of a Customer's equipment is a priority for our company, so we can offer customized and cost-effective solutions for many industries.

## Advantages

1. High resistance to abrasive wear and shock loads.
2. The usage of self-blocking tiles (lock technology) provides a monolithic self-supporting arc design and eliminates the risk of tearing off ceramic elements.
3. Increased service life significantly reduces equipment maintenance costs.
4. Convenience of installation under various operating conditions (flange, retaining, quick disconnect couplings).
5. A possibility to use under high temperatures of transported material.
6. Eliminates the risk of fire hazard.
7. Resistance to aggressive environments and corrosion (inert to acids, alkalis).



Branch pipe lined by Al<sub>2</sub>O<sub>3</sub> ceramics



Lining by SiC ceramics

## Ceramic combined protection of the equipment

1. Reduces downtime.
2. Significantly reduces maintenance and repair costs.



Ceramic lining

Composite protective material or SiC ceramics



## Bimetal plates

### Product description

Wear-resistant composite steel plates consist of 40-60% chromium carbide alloy deposited on a steel substrate using arc welding. The base steel layer assumes mechanical stress, and the welded layer, with a high content of chromium carbide, is resistant against corrosion and is used as protection in extremely corrosive media. Surface hardness of the welded layer can reach HRC 67.

### Main components of the welded layer

C 3.0-5.0 % and Cr 25-40 %. The high wear resistance is provided by large amount of Cr<sub>7</sub>C<sub>3</sub> solid chromium carbide particles (microhardness up to HV 1800).



Thickness of the welded layer can be from 3 up to 20 mm. Minimal thickness of the steel substrate is 6 mm and further without restrictions.

Standard plate size: 1200x2000 mm, 1450x2900 mm.

It is possible to cut to the required size and geometry in accordance with the Customer's drawings.



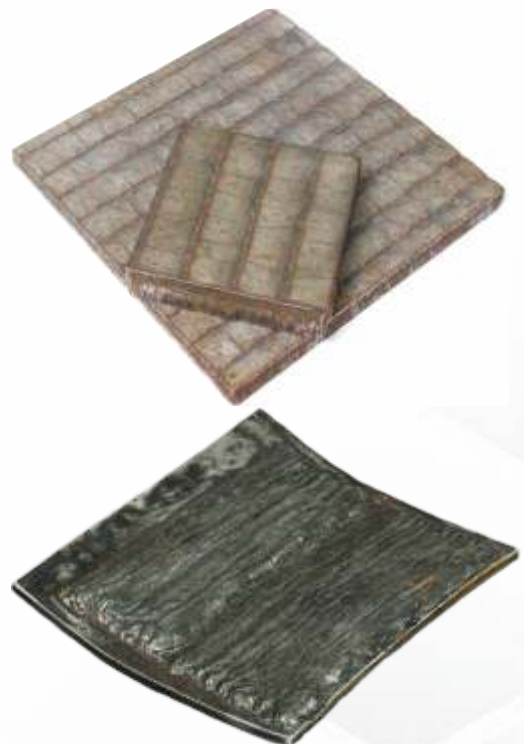


### Advantages of bimetals:

- resistant to temperature drops up to 800 Kelvin degree;
- have high impact and wear resistance. **Wear resistance in 12-20 times higher than of standard steels, in 5-10 times higher than low alloy steel plates, and in 2-3 times higher than chrome cast iron;**
- able to withstand high temperatures – up to 600°C;
- able to withstand the impact of acids, salt solutions and organic solvents;
- have high resistance against electrochemical corrosion.

### Application

Mining industry, steel industry, cement industry, energy industry, port terminals.



## Wear resistant composite steel pipes (from bimetals)



The usage of bimetals allows to increase the service life of equipment by **10 times** in comparison with wear-resistant steels under the same working conditions.







# Adhesive composition CeraFix EPO for ceramic lining application

Universal two-component adhesive on an epoxy basis with a complex mineral extender.



**This adhesive composition is a proprietary product, manufactured on the territory of the Russian Federation, fully complies with all requirements for adhesion in Metal-Ceramics compounds, that would not disgrace foreign analogues.**

## Application

It is designed for gluing ceramic mosaic mats onto metal surfaces of conveying and mining equipment.



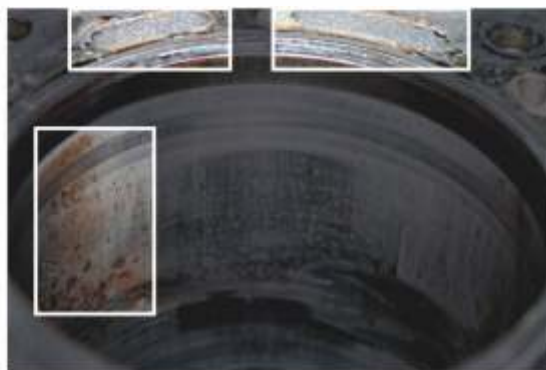
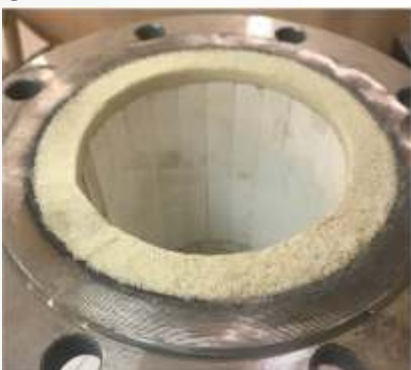
Base	Epoxide resin
Consistence	Nonsettling viscous paste
Mixture rating	Base: 71.4% (mass) Solidifier: 28.6% (mass)
Colour	Semitransparent / light-gray
Density	1.12÷1.16 g/sm <sup>3</sup>
Solvent	Acetone; mixture of acetone (50%) and isopropyl (50%)
Dry solids content (complex flame-retardant filler)	49% (mass)
Lifetime before polymerization under (T=20±12°C)	Not less than 70 minutes
Time to achieve transport strength (T=20±12°C)	16 hours
Time to achieve maximal strength (T=20±12°C)	3 days
Adhesion to steel and ceramics, not less than	50 MPa
Expiry date	12 months from the date of issue when stored at a temperature of 5°C to 30°C and a relative humidity not more than 80%. Direct sunlight is not allowed.

## Composite material for protection of metal surfaces against abrasive and erosive wear



The fine-grained composition (with arbitrary-shaped agents) for protection against wear during sliding is intended for repair and restoration of any metal surfaces that are subject to strong abrasion, erosion / corrosion.

Reliable protection of new and worn metal surfaces up to 10 mm thickness. For application the material a pallet or a plastic applicator are used. One set consists of two components: A (4 kg) and B (1 kg). The material is produced in white color. The average consumption, depending on the size of the fraction, per 1 square meter is 5-6 kg of mix if the thickness of a layer is no more than 3-4 mm.







## Sand nozzles for hydrocyclone

Siberian Lining Company LLC.  
Manufactures and delivers wear resistant sand nozzles for any types of hydrocyclones.

Sand nozzles can be made on the basis of silicon carbide (SiC) and aluminum oxide (Al<sub>2</sub>O<sub>3</sub> 92-95%) of any standard sizes according to the customer's request.

**The following options are possible:**

- without case,
- metal case,
- polyurethane case,
- fiberglass case.



Sand nozzles from Al<sub>2</sub>O<sub>3</sub> 92-95% without case



Sand nozzles in metal case



Sand nozzles from SiC without case



Sand nozzles in polyurethane case



Sand nozzles from polyurethane without case

## Products



Sand nozzles from SiC without case. The case is made from extremely durable fiberglass. The nozzles have increased wear resistance in combination with a lighter weight, which gives the greatest economic effect.

### Main types of hydrocyclones

Material	Hydrocyclone type
Al <sub>2</sub> O <sub>3</sub> 92-95%	hydrocyclone GCP-1200 hydrocyclone GCP-1000
SiC	hydrocyclone GCP-1000 Krebs hydrocyclone GCP -750 hydrocyclone GCP -710 hydrocyclone GCP -500 hydrocyclone GCP -360 hydrocyclone GCP -250-10 hydrocyclone GCP -250 hydrocyclone GCP -100 hydrocyclone GCP -75 hydrocyclone GCP -50 hydrocyclone GCK-150 hydrocyclone GCK -250 hydrocyclone GCK -360-10 hydrocyclone GCK -360 hydrocyclone GCK -380 Krebs hydrocyclone GCK -500 hydrocyclone GCK -710 hydrocyclone GCK -750 hydrocyclone GCK -1000 heavy medium hydrocyclone GT - 1 000

### Mean running life of the nozzle in operation at the mine

Polyurethane, rubber	Al <sub>2</sub> O <sub>3</sub> 92-95%	SiC
3-10 days	14-30 days	30-90 days

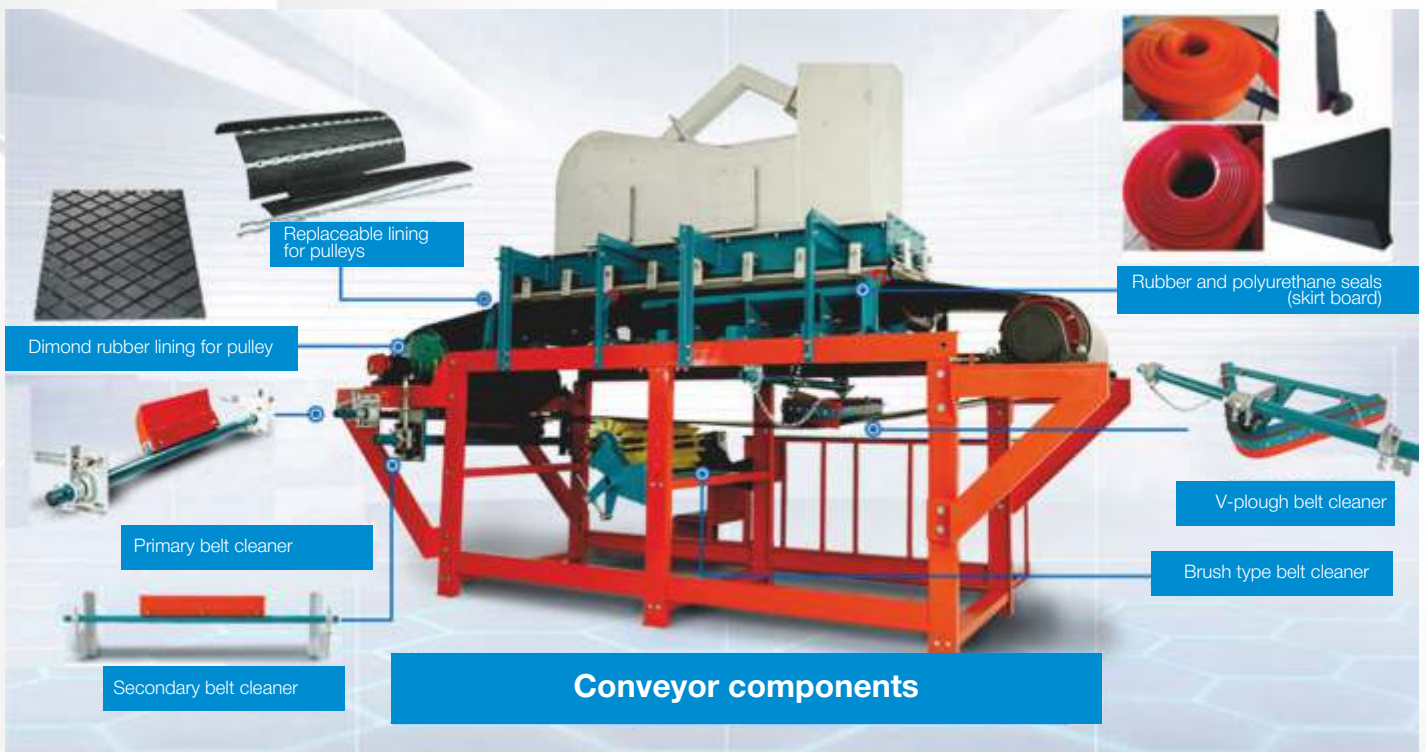


# Components for conveyor equipment

Siberian Lining Company LLC. offers to supply high-quality components for conveyor equipment from leading manufacturers.

Installation of additional components on the conveyor equipment allows to increase the efficiency and productivity of the installed equipment and facilitate its operation at the enterprises of the mining and processing complex.

In our catalog you will find conveyor components of different types and sizes, possessing high maintainability and ease of installation.





# Technological advantages



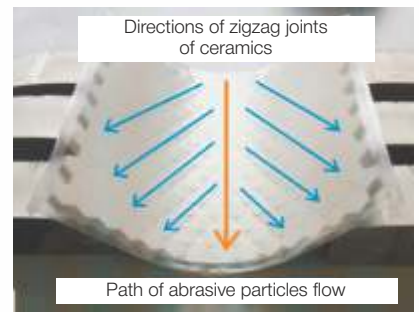
The usage of constructive forms of ceramic elements provides the application and replacement of linings without making changes in the design and technological processes.

The absence of glue flows on the ceramic surface allows to maintain the maximum adhesion ratio of the lined pulley.



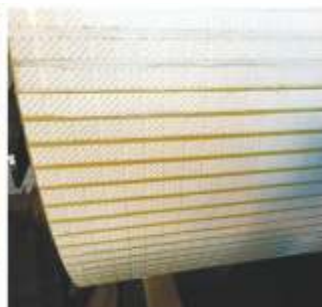
The possibility to cut and fit ceramic elements with complex mating surfaces without breaking and chipping.

The possibility to lay out the inner conical surfaces with a combination of any curvature radius.



Path of the zigzag joint along the abrasive particles flow

The asymmetric arrangement of the joints between the elements ensures long-term abrasion resistance of adhesive joints, comparable to the resistance to abrasive wear of the ceramic elements themselves.





# Services

Siberian Lining Company LLC. carries out in a short time repair and lining works by Al<sub>2</sub>O<sub>3</sub> ceramics of worn parts and working surfaces of the following equipment:

- pulleys of belt conveyors of all sizes;
- heavy-medium hydrocyclones and section elements;
- technological tanks (boxes, sand baths, sumps);
- precipitation centrifuges and decanters (augers, scaler and unloading equipment);
- boot cone and gutter;
- flow distributors, separators, collectors;
- technological and main pipelines (straight sections and bends of pipes, branches, tees, fittings, etc.);
- wear-resistant surfacing electrodes.

All works can be performed at the locations of own production, as well as with the departure of specialists to the Customer's enterprise.

A guarantee is provided for at least 12 months from the moment equipment is commissioned.

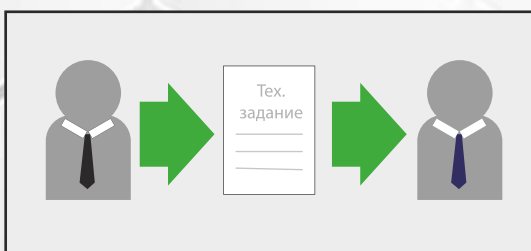
Siberian Lining Company LLC. in a short time delivers lining materials based on Al<sub>2</sub>O<sub>3</sub> ceramics and has a warehouse reserve for the following types of products:

- ceramic elements (tiles of various sizes, delivery in pieces or applied to the stripping film), installation with adhesive material or fixation by welding;
- ceramic and rubber-ceramic lining of conveyor pulleys;
- ceramic-rubber plates with fixation by welding or bolting;
- manufacture and supply of finished equipment coated with ceramic lining;
- delivery of rubber-ceramic and steel pipelines with internal lining based on Al<sub>2</sub>O<sub>3</sub> (alumina) and SiC (silicon carbide) ceramics of various lengths and internal diameter;
- delivery of glue composite material based on epoxy CeraFix EPO for fixing ceramics and repairing worn lining;
- delivery of composite lining materials (brand Ceramet, CeraFix EPO HD);
- supply of composite materials for prompt repair of equipment;
- supply of sand nozzles for all types of hydrocyclones.



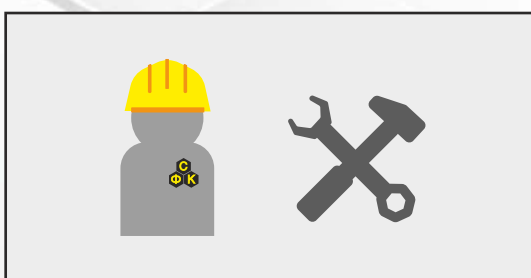
# Workflow

1



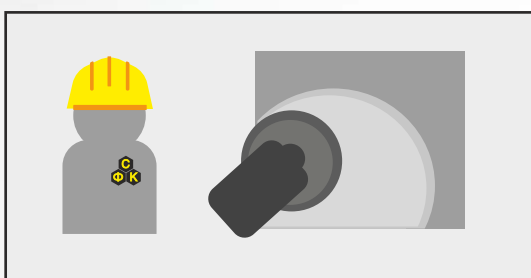
Technical specifications from the Customer.

2



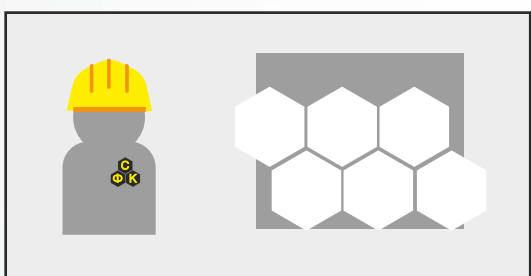
Manufacture of new equipment from metal or delivery from the Customer.

3



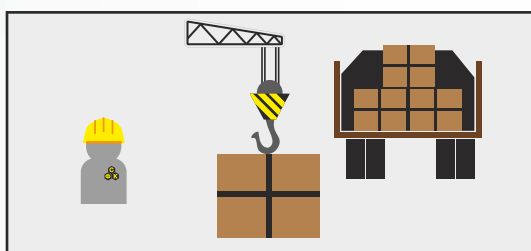
Preparation of metal surface.

4



Application of ceramic material (glue, welded or bolted).

5



Shipment of the finished products.



# Portfolio







We are interested in partnership with Your company in the field of supply of lining plates of various shapes and volumes and equipment lining at terms favorable for You.

In cooperation with the leading research centers, our company is ready to consider any of your technical requirements for lining of the equipment.



**Thank You for Your attention!**



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