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| **NAME OF THE EQUIPMENT:** | **Belt filter press** |
| **PROJECT:** | PP Krasnobrodskaya |
| **CONTRACT:** | No. 955 of September 10, 2008 |
| **POSITION:** | 124 |
| **QUANTITY:** | 1 |
| **SERIAL NUMBER:** | 1110504 |
| **DRAWING NUMBER:** | 1110504-GA |
| **TYPE:** | BELT (WITH RIGHT-HAND DRIVE) |
| **MODEL:** | WX-3.0G |
| **WIDTH OF FILTERING BELTS:** | 3 M |
| **TOTAL WEIGHT:** | 12 247 KG |
| **DESIGN DESCRIPTION:** |  |

**Note**

Designed for continuous dewatering of fine solid particles. Dehydrated cake has a high content of solid particles and low surface moisture. The moisture content of the cake is largely determined by the amount of chemical reagents injected into the pulp.

**The main components of the filter press**

- A mixing device built into the power supply pipe with a flocculant solution supply nozzle;

- Power distributor;

- Power Storage box;

- Gravity drainage zone;

- Adjustable wedge-shaped zone;

- Compression/cut zone on a large diameter roll;

- High compression/cut zone on small diameter rolls;

- Scraper system for cake removal;

- Pneumatic belt alignment system;

- Pneumatic belt tension system;

- "Self-cleaning" filtering belt flushing system;

- High-strength galvanized frame;

- Adjustable speed drive;

- Control panel;

- Washing water and filtrate collection system;

- Internal piping and electrical wiring system;

- Dewatering/Filtering belts.

**Operational process**

The filter press operates in continuous mode. Before entering the filter press, the feeder pulp is treated with flocculants that provide agglomeration of fine particles for effective dewatering on the filter press.

Uniform distribution of the flocculant in the pulp is ensured when it passes through a static mixing device. The power distributor evenly distributes the incoming pulp containing flocculants over the gravitational drainage zone of the filter press. The pulp is held in the gravity drainage zone by means of a power storage box mounted on a frame. The gravity drainage zone has a slope that facilitates the passage of water through the lower filter belt. The filtrate is collected in a collecting tray of the gravity drainage zone. The pulp dehydrated in the gravity drainage zone enters an adjustable wedge-shaped compression zone, in which the upper and lower filter belts converge and smoothly compress the pulp between them. The liquid squeezed out of the pulp passes through the belt and is collected in a collection tray of a wedge-shaped zone. The dewatering process is intensified in the compression/shear zone on a large diameter roll. Then the belts with the material between them pass through a series of rolls of successively decreasing diameter, providing strong compression and shear. The dehydrated cake is removed from the filtering belts using special polymer scrapers.

On the way back to the power supply area, both filtering belts are washed, aligned and adjusted in tension.

**Design description**

Load-carrying construction

The high-strength load-bearing frame of the filter press and its individual components are specially designed to work in particularly heavy conditions. Before shipping, the filter press was fully assembled to check its proper functioning. When installing a filter press at the workplace, a minimum number of assembly operations is required.

Rolls

All rolls are mounted on short rolls. The diameters of the bearing sections of the shafts are 74.6 mm – the same for all rolls, regardless of their diameter, which makes it possible to use bearings of the same size in the filter press.

The working surfaces of all rolls have anti-corrosion protection. The rolls are covered with rubber 10 mm thick, characterized by optimal friction properties, high corrosion resistance and long service life. For all rolls of the compression zone, the sections of the shafts between the bearing landing surface and the end of the roll have an increased diameter to ensure greater strength.

Bearings

The installation uses interchangeable SAF bearings. Bearing life under normal operating conditions is not less than 500 thousand hours. The bearings are located in detachable housings that provide ease of maintenance, and are equipped with V-ring seal (TSN A) sealing units that provide reliable protection of the bearings when working in harsh conditions.

Belt alignment system

The upper and lower filtering belts each have their own continuous alignment system, which maintains the correct position of the belt. The alignment systems are equipped with a pneumatic drive.

Belt tension system

The upper and lower filtering belts each have their own system of continuous automatic maintenance of the belt in a stretched state. Each system contains two pneumatic bellows. Automatic belt tension control is carried out via the filter press control panel.

Power distributor and power storage box

The power distributor and the power storage box, ensuring an even distribution of power over the gravity drainage zone, are made of 304 stainless steel.

Pallet for collecting filtrate and washing water

The pallets for collecting filtrate and washing water are made of 304 stainless steel. The containers of the pallets are designed for the maximum amount of water passing through the belt both in the gravity drainage zone and in the wedge-shaped zone.

Corrosion protection

The frame and individual parts of the installation have surfaces prepared according to the SP-10 standard, with a zinc coating with a thickness of about 100 microns and an external protective two-component epoxy coating with a thickness of at least for additional protection.

Securing attachment

All securing attachment are made of 304 stainless steel.

Mechanical drive

The mechanical drive unit consists of an electric motor, a gearbox with bevel gears and a frequency converter that allows you to adjust the speed of the belts during the operation of the filter press.

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| **TECHNICAL CHARACTERISTICS OF THE DRIVE:** |  |
| **Electric motor power:** | 5.5 KW |
| **Supply voltage:** | 380V / 3 PHASE / 50HZ |
| **Design of the electric motor housing:** | TEFC |
| **Type of gearbox:** | HELICAL |
| **Gear ratio of the gearbox:** | 86:1 |
| **Output shaft rotation frequency:** | 17 RPM (AT 50 HZ) |

"Self-cleaning" belt washing systems

The upper and lower filtering belts each have their own flushing systems operating in continuous mode. The concentration of suspended solids in the washing water supplied to the distribution pipe and nozzles should be no more than 200 ppm (parts per million).

Cleaning of the flushing system is performed by turning the hand wheel: in this case, solid particles are removed from the spray nozzles by a brush mechanism mounted on the shaft.

Scrapers

The scraper assembly ensures the removal of dehydrated cake from the belts. The upper and lower belts each have their own scraper assembly. The scraper is easily removed, its position can be adjusted.

**General requirements:**

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| for service clearances: | - at least 1220 mm from the drive side- a gap of 30-50 mm on the opposite side is strongly recommended in case of replacement of the rolls |
| for the total water consumption for washing belts: | - 27 m3/h at 689 kPa |
| for the air flow rate for belt tension and alignment systems: | - 85 l/min (on suction) at 689 kPa |

**DATE OF COMMISSIONING:**