

WORKSHOP RENOVATION FOR A LONG-ESTABLISHED RUSSIAN FLOUR PRODUCER

Chelyabinsk Association Soyuzpichsheprom LLC in Russia, founded in 1898, has consistently supported Russian residents and soldiers with its products as far back as the Great October Socialist Revolution and World War II.

Now, the company has developed into one of the largest grains and oil enterprises in Russia, with four production bases.

The company's main products include vegetable oil, flour, macaroni, rice together with muesli, breakfast cereals, snacks, etc. The company exports products to the CIS, China, the United States, Canada, Germany, Israel and the United Arab Emirates to name just a few.

In July 2018, the company carried out the Technical Transformation and Upgrading Project of '250 tonnes/day flour production line' in one of its production bases, which was undertaken by COFCO Engineering and Technology (COFCOET).

COFCOET, under COFCO Corporation, is a flour engineering business which involves technical consultation, engineering design, equipment manufacturing and supply, general contracting of complete sets of projects of flour and grain processing.

The Technical Transformation and Upgrading Project included process design, equipment manufacturing, cargo transportation, civil engineering transformation and equipment installation and commissioning.

It took a total of 180 days to successfully complete the commissioning of process equipment by January 2019 and all indicators have reached the expected requirements.

The main features of the project are briefly described as follows:

1. The original workshop was designed for a 92 tonnes/day wheat



processing flour production line, with a very limited construction area. In order to increase the processing capacity to 250t/d, five wheat tempering bins were added next to the original workshop and arranged in parallel. At the same time, a passenger-and-freight elevator was also added to reduce the labour intensity of operators.

2. Due to the increase of equipment quantity and weight after technical improvement, not only enough pedestrian paths should be considered but also the original beam-column structure should be kept in the equipment layout.

For example, the roller mills were arranged on two floors, with their driving motors installed on the same floor and the materials moved into the chamber after grinding by roller and then exhausted from the chamber directly; the plansifter is hanged by the integral steel beam.

With above mentioned design, the load bearing to the original workshop is not affected and the safety and reliability of the equipment in process were ensured.

3. According to the actual features of raw grain and product requirements, with the combination of the existing conditions of the workshop, the production process was specially customised.



The cleaning sections

In the cleaning section, the process follows: Three-times screening; bran finisher and scourer; twice destoning; four times aspiration separation; three times dampening.

This cleaning process is optimised to create favourable conditions for flour milling. In the milling section, 4B7M2S2T6P3Br process is adopted and eight-roller mills were partially used to reduce the screening area and save space.

A series of new-type wheat-cleaning and milling equipment were used to ensure the advancement of equipment.

- 1) The extrusion friction - even striking with each other - between the plates and kernels, the kernels, kernels and the inner wall of barrel were enhanced by a FNSW new-type friction wheat scourer, making the kernel surface more smooth and clean, which removed not only the wheat hair, dust and impurities but also the pollutants on wheat to reduce the ash content and microbial content on the surface of wheat
- 2) The TQLX-type rotary vibrating screen is a new type of cleaning equipment which combines the different characteristics of vibrating cleaning screen and rotary screen, suitable for the cleaning of particle materials with large capacity. This machine is especially strong and good at cleaning and can be operated and maintained conveniently. Equipped with air separator, it can remove light impurities without dust overflow in negative pressure working statuses.
- 3) A RDW-type colour sorter has been widely used for wheat selection in the cleaning section of wheat processing recently. By removing organic impurities, such as oats, buckwheat, grass seeds, mouldy kernels and injured kernels and the inorganic impurities, such as sand and mud from the raw wheat the flour colour and processing, accuracy is ensured. The quality of final product is improved as well.
- 4) Besides the original characteristics of the air-controlled roller

mill, the material-contact parts of MMT electronic-controlled roller mill are all made of stainless steel, leaving no dead space and meeting higher requirements of food hygiene. The convenient and reliable air cylinder knob-locking method is used in the locking mechanism of its roller adjustment wheel, instead of the mechanical handle with retracted screw which is easily stuck.

The feeding mechanism is controlled by variable frequency motor, which can adjust the rotating speed of feeding roller according to the flow changes of feeding materials for easy operation.

- 5) The new type of aluminium alloy sieve frame, which increases the screen area and capacity, is used by FSFG plansifter; the door and the channel of the plansifter are effectively sealed to ensure no crossing or leakage of flour powder; the whole machine is in fully enclosed structure with built-in transmission motor and nice appearance.

The perfect process design and the advanced equipment selection lay the foundation for the stable production of the flour workshop.

Now the flour is being used in new products produced by the company, such as hand-rolled noodles, grain dry noodles, buckwheat noodles, etc. which are all welcomed in both domestic and overseas markets.

