The Chinese particleboard industry has invested in a new drying technology. The first owner of a belt dryer in an all-new particleboard line is Xin Li Da Wood Industry Co., Ltd., based in Chiping, Shandong province.

China’s developing particleboard market inspires producers to try new ways of processing their wet material. In order to obtain best product quality in terms of moisture content, color as well as particle surface properties, Xin Li Da decided to be the first particleboard producer to use a belt dryer. Although the whole particleboard line was already planned, they changed their mind in terms of the drying technology shortly before the planned start-up date of the production line. Other reasons why Xin Li Da chose to use a belt dryer are an existing heat source, low dust, VOC and odor emissions. Another major reason is process safety—a low risk of fire and explosion because no direct heat source is needed and because the drying process works at low temperatures.

SWISS COMBI was chosen to provide the belt dryer, which SWISS COMBI has installed in more than 100 sawdust and wood chips dryers, mainly for the wood pellet industry. After tests on existing SWISS COMBI dryers, important and process relevant changes of the layout were made. The contract was signed with both parties being confident the dryer can achieve the required <2% final moisture content for all particles at the dryer outlet.

SWISS COMBI belt dryers—in most cases—come with a two layer system in order to achieve longer residence time of the wood flakes as well as an increased thermal and electrical efficiency of the drying process. To achieve <2% final moisture content, the residence time and therefore the second layer has been extended to almost the whole length of the dryer. This not only allows Xin Li Da to achieve lower moisture content but also keep the high thermal efficiency of the drying process. Although it is very inefficient to evaporate the last bits of water from a biomass material, SWISS COMBI found an easy and affordable way to even increase the thermal efficiency. This comparison is based on a particleboard belt dryer against a drum dryer as well as a single layer belt dryer used for pellets with much lower requirements of product quality.

Xin Li Da has the opportunity to receive low pressure steam from a nearby CHP plant. The steam is used for the drying as well as for the production process. Because ambient air needs to be heated to 110°C only, the wood flakes are treated very gentle and it is also possible to return the condensate at a temperature not more than 20°C above ambient air temperature. This brings energy extraction from steam to a very high efficiency.

A quick timeline was also crucial to Xin Li Da’s decision, including a short delivery time and short installation period: Six months and one week after the effective date of contract, the first particleboard was produced. A week later, the whole particleboard production line started continuous 24 hour production.

Commissioning took place during rough weather conditions with -14°C outside air temperature. This has been a good test for the equipment to show its reliability and capacity under difficult conditions.

A belt dryer for 18 t/h of water evaporation is an interesting investment. To achieve an even further decrease of investment costs, voluminous parts were organized by the client in order to profit from local prices as well as lower freight costs. SWISS COMBI provides engineering and design services for those parts as well as all the mandatory lists of components for the MCC and PLC system.

During the project, including the contract closing, SWISS COMBI worked with Changzhou Qingshan Energy Equipment Co., Ltd. Qingshan in this case acts as partner for sales, project managers as well as supplier of certain components such as the control system or the energy supply system. Qingshan Energy Equipment was a very reliable partner with all of the required knowledge of the Chinese market and of the logistical challenges involved between the client and suppliers.

Xin Li Da looks forward to years of safe and reliable production of particleboard for an increasing demand over the whole People’s Republic of China. Further projects are planned and SWISS COMBI is convinced that additional particleboard lines will be equipped with its belt dryer.