TransBale

Efficiency throughout the pulp logistics chain

Metsä Fibre’s new bioproduct mill in Äänekoski, Finland, is more than just the biggest wood processing plant in the Northern Hemisphere and the center of a bioproduct ecosystem. It also represents the first large-scale installation of Pesmel’s TransBale high-bay storage system. What makes TransBale special, and what does the future hold?

The Äänekoski mill can produce 1.3 million tonnes of pulp a year, in five product types with over 20 different quality criteria. Of this, 800,000 tonnes is transported by train to Helsinki for export by ship, another 100,000 tonnes by train for domestic use, and about 400,000 tonnes by truck to other domestic customers or for internal use. Metsä Group decided that for these kinds of volumes, the traditional handling and storage methods simply were not sufficient. They had already had good experiences with Pesmel’s TransRoll system for paper rolls, and Pesmel were keen to suggest their latest innovation: TransBale.

TransBale is an intermediate, high-bay storage system for bales of pulp. In traditional pulp-handling facilities at mill and harbors, the units of pulp are handled by operators driving clamp trucks in large warehouses. TransBale works in a very different way. It uses automated stacker cranes to move the bales with no operator involvement. With TransBale, the achievable storage density is three times higher than traditional methods, meaning that the same amount of pulp can be handled in a smaller footprint, or the facility can have the capacity to store far more in the same space.

Challenges and benefits

TransBale was developed from Pesmel’s TransRoll system, which handles and stores rolls of paper or metal. The main difference lies in the nature of the bales of pulp. Rolls of paper or metal are uniform in terms of dimensional tolerances. Bales of pulp have a more irregular shape and their dimensions vary due to a variety of production factors, such as the level of moisture in the pulp. This makes automated handling particularly challenging, as the system has to cope with a degree of variation in size and shape. Many other automated systems are unable to cope with this aspect of pulp bales, but Pesmel’s engineers have developed a solution that works very well.

TransBale handles the pulp bales from the bottom, which allows it to cope with differently sized and shaped loads. The stacker cranes store the bales on racks, rather than stacking them on top of each other. With clamp truck handling, the maximum height of a stack of pulp bales is four or five units. With TransBale, this is increased to 15 units. TransBale’s stacker cranes are highly efficient, very fast, and completely automated. One stacker crane has the same throughput as four or five clamp trucks, and it does not require an operator.

A successful first project

The TransBale system can cope with first-in, first-out loading, and it can do sorting as well. It also features a number of sophisticated tracking and optimization features. At Äänekoski, the TransBale system serves as an intermediate buffer storage between the mill’s production units and the loading facility. It has the capacity for 25,000 tonnes of pulp – the equivalent of five days’ production. Train loading is fully automated, and up to 1,400 tonnes of pulp can be loaded onto a train in only three hours.

The scale of the project at Äänekoski and the fact that it was the first of its kind made it somewhat challenging, but the project remained well within Pesmel’s capabilities. From signing the agreement to the startup of the system was just 18 months, but of course there was a great deal of advance work and planning before this took place. The system has now been up and running for over six months, and it has met the requirements that Metsä Group had for it.

Pesmel’s engineers have also used the practical experience of the installation to come up with a number of development ideas, and the flexible, extensible nature of TransBale means that further improvements will be easy to implement as well.

The future for TransBale

For Pesmel, the Äänekoski project has taught them a lot about pulp mill operations – and logistics. The potential uses of TransBale are not limited to the pulp mill. TransBale is not just an effective storage solution, it is also a cutting-edge logistics situation. It works as a key link in the logistical chain, wherever that may be. It can be utilized at mill sites as a link between production and transportation, synchronizing production with the logistics chain. It works equally well in harbors, where trains arrive to unload bales of pulp for ship transport. TransBale is the ideal solution for the intermediate storage of the many bales of pulp which need to wait at the harbor to be loaded onto ships. Pesmel’s engineers are already hard at work developing harbor handling systems to bring the same advantages to vessels and reduce the amount of time ships spend in port. Pesmel are hopeful that, in the future, TransBale will come to dominate the logistics chain for pulp, as mill owners and harbor operators come to realize the benefits of this cutting-edge, automated bale handling and storage solution.