

Siempelkamp Maschinen- und Anlagenbau build the world's biggest knife-ring flaker setting a

Big, bigger, strander

How do you call a machine that – built by engineers in their own factory – already beats all records as to its dimensions? Being unique for the size of this machine type throughout the world? And standing for the innovative performance of the company? The name search for the Siempelkamp strander 250-850-56 (diameter – cutting width – number of knives) is only a part of the whole – the story behind it is a matter of a complete system.

By Wolfgang Holzer

In May 2010 already OOO DOK Kalevala St. Petersburg, Russia, signed a contract for its location in Petrozawodsk, province of Karelia, on a complete line for OSB. 30 years after sale of the first OSB press this order is a significant milestone for Siempelkamp as full-system supplier and its market positioning. In addition to the particularity of being Russia's first OSB line this order features further potential of launches: For the first time Siempelkamp builds an own round log knife-ring flaker – the world's biggest strander. Big challenge for people involved in planning, designing and manufacturing processes at the Krefeld site.

Not only dimension or output volume (45 t/h at 0.65 mm chip size) of the new Siempelkamp knife-ring flaker looks like a new record: For operation of this giant a motor power of 1,250 kW is required. For comparison: With the required quantity of electricity per hour a two-persons-household could be completely supplied during one year. To test the 10,000-Volt motor with a speed of 1,000 rotations per minute, even two diesel units had to be taken to the manufacturing site in Krefeld. As a result of the direct connection to the

mains in Krefeld the supply of the complete district would have been probably impaired. Additionally 10 m³ of logs for the first start of the strander were brought. A quantity of timber that was processed by the machine to first-class strands within 100 seconds only. A short-term pleasure only? Not at all for the customer. OOO DOK Kalevala will use the knife-ring flaker very soon in its complete OSB line.

Record strander: a very special feature of the complete line

The new Siempelkamp strander perfectly fits in the complete line offered for OOO DOK Kalevala – a significant example for Siempelkamp's concept "supplier of equipment from one source". In addition to a continuous press, a 9' x 50.4 m ContiRoll®, the complete front-end equipment including debarker, dryer, screens, glue mixing station, dosing system and metering bins formed part of the scope of order. To unfreeze the frequently frozen logs on site of the customer additionally so-called log ponds are provided. Separate energy systems are also included in the scope of supply. The portion of finishing equipment includes two double-diagonal

saws and cooling device and stacking unit as well as large stack magazines and cut-to-size and packing lines.

The order offers another innovation in the field of finishing. Siempelkamp Handling Systems developed a new stacking system whose execution corresponds to customer's request as to minimum panel board width of 635 mm only. The safety gear integrated in the machine provides for continuous stacking process and the subsequent stack transfer to the next machine in spite of fast cycle times of the line. The stacker allows for the handling of complex cut-to-size images as well. Another special feature of the order is the two-stage concept developed by Sicoplan for performance extension of the line.

Two stages for complete performance

The OSB line operated by OOO DOK Kalevala will produce daily 750 m³ in the first stage. After upgrade to stage two the double capacity of 1,500 m³ per day will be achieved. The forming and press line has been already designed for such a high complete performance – front-end and finishing systems will be extended later

further milestone as full-system supplier

250-850-56

The strander in the test phase



according to the first stage. Also the performance of the energy system will be increased in the range of this concept of 50 MW and doubled to 100 MW by means of a second system. Additionally, a twin of the new Siempelkamp strander will contribute in the second section to the overall performance of the line.

The concept has an enormous benefit for OOO DOK Kalevala: The line does not have to be stopped to upgrade to double

capacity. The outstanding highlight of the OSB line will probably be the new strander. It has been planned, designed and built at the Krefeld site and will soon go on a trip to Eastern Europe to be assembled and commissioned there through Siempelkamp.

A strander for Russia

Russia's first OSB-Strander is an innovation. With a cutting width of 850 mm

Discharge section in the test unit





The worldwide biggest knife-ring flaker in the Siempelkamp production halls

and an inner diameter of the knife-ring of 2,500 mm equipped with 56 recently developed knives the machine runs at a cutting speed of up to 35 m/s. The maximum throughput rate of 45 t atro/h combined with the high cutting width turns the strander as to extraction volume to the world's biggest knife-ring flaker. A record that becomes obvious when looking at the dimensions of the strander: with a length of 20 m (strander plus filling station), height of 3 m and width of 7.80 m the blue and yellow jumbo impresses the observer.

The dimensions of the strander however entail some challenges, but also provide

for favorable occurrences at the same time. "The larger such a knife-ring flaker is, the more satisfactory the proportion of chipping and down time," explains Wolfgang Holzer, group leader of the design department. For the new strander a chipping time of 61% is compared to a reduced downtime of 39%. In addition to that, exact cutting precision is enabled through such a large flaker: it is able to produce chips of 0.65 mm with a precision of $\pm 1/10$ mm. The dimensions of the flaker also have a positive impact on the throughput rate: The entry time is up to approximately 15 seconds, replenishment is already possible after 9 seconds. This velocity requires exact planning until the smallest element.

The increased benefit is in the detail

The particularities of the new strander design are not only reflected by large dimensions, but also by smaller details. The front carrier ring is equipped with a set of high-quality wear segments. For the customer a real advantage: It is no longer necessary to replace the complete carrier ring; only the wear parts are exchanged. Owing to the improved knife arrangement the chip quality is additionally increased.

Scorers integrated in the knife units facilitate clear cutting edges, a special mechanical system provides for optimal clamping force of the knives by means



Replenishment after 9 seconds: possible by the new filling station



The hydraulic aggregate operates with 2 x 110 kW

Log-pusher and clamping wedges

of centrifugal force (centrifugal wedge clamping principle). Due to the reduced cutting angle – previously 34°, now 29° – up to 2% less of fine materials is generated. A knife is easily changed by means of pressing the centrifugal wedge down. This is done automatically via additional hydraulic cylinders and a hydraulic motor thus minimizing the maintenance expense. This is a clear benefit for the customer who will very soon produce OSB as Russia's first plant operator.

Application for the strander

OOO DOK Kalevala will apply the new knife-ring flaker within its new complete OSB line that is planned, designed, built, delivered, assembled and commissioned through Siempelkamp. As raw materials for the produced OSB local timbers are primarily used: 90% of aspen is machined, a timber that is especially well suited for structural panels due to its bright optics and low mass. By means of a groove and tongue panel plant to be installed as well floor panels are made. These products are applied among others within the group of the principal: OOO DOK Kalevala forms part of the structural engineering group Kompakt realizing large industrial buildings and requiring OSB accordingly.

The customer thus has to meet with his own requirement – the demand is huge. The high demand for finished products makes a line with maximum capability indispensable. The latter one amounts to a final extraction capacity of 1,500 m³ of panels per day. For this purpose OOO DOK Kalevala is in need of quite a lot of timber that at first has to be machined to strands in a flaking process. A very sophisticated request of the customer Siempelkamp has complied with by means of the strander 250-850-56. Mid-2012 already the new knife-ring flaker will be ready to operate. Last but not least the question remains unanswered how this record machine shall be named.



Main drive motor



Impressive dimensions – strander from its main drive side

