

SR-Schindler Maschinen-Anlagentechnik GmbH, 93057 Regensburg, Germany

## Splitting line featuring robot infeed and robot packaging

Thanks to a cooperation between SR-Schindler and CPT, its Scandinavian representation, a SR-Schindler splitting line for wall blocks started production with St. Eriks in Staffanstorp/Sweden in the summer of 2011. The line is designed in U-shape for product in-feed and packaging by means of a centrally positioned ABB robot. Due to the product variety and the associated different packaging patterns, robot-supported product handling was the most flexible solution.

The palletized products are transported by means of a heavy duty roller conveyor to the unloading position of robot IRB 7600 equipped with a lightweight pincer-type grab. The grab takes off the individual product layers sized 1,200 x 800 mm from the product package and places them on a belt conveyor. The layers are then transported with their 1,200 mm edges in the feeding direction. A pushing device featuring a measuring system for proper positioning of the individual product rows below the splitter then transfers the rows to the 1st splitter.

Unloaded pallets are stacked in an empty pallet storage facility with reversible chain conveyor so that the pallets can be returned to the loading station of the processing line at a later stage.

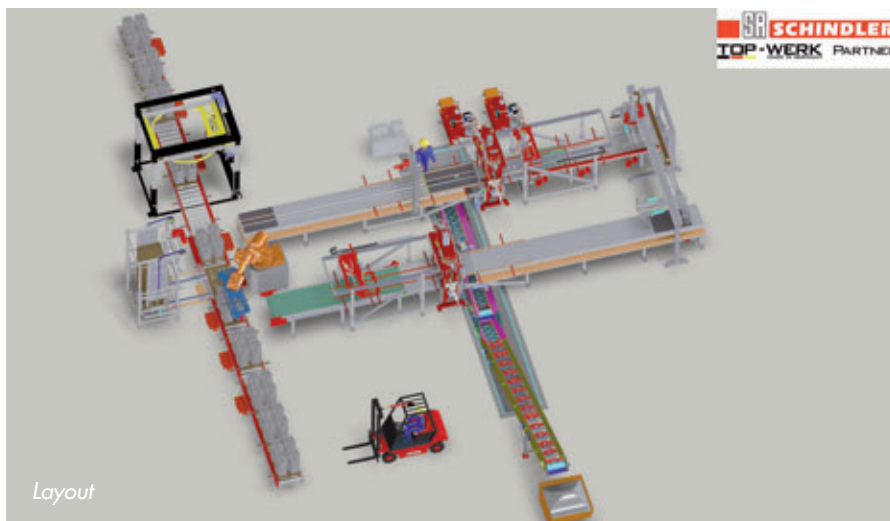
The 1st splitter has been designed for a working width of 800 mm and a maximum splitting height of 280 mm. The functional principle is similar to that of pincers, i.e. the upper knife row moves down and then grabs the products to be split. At the same time, the upper knife row's lowering motion causes the lower knife row to be pulled up towards the product row and splits them. Every cutting row consists of 4 single knives exerting a splitting force of 600 kN. Lateral

knives to the left and right support the splitting process if single products are to be split one after another. The splitting height is adjustable by means of 4 hydraulic cylinders located in the upper row. To even out product height differences, the upper knives are individually moveable.

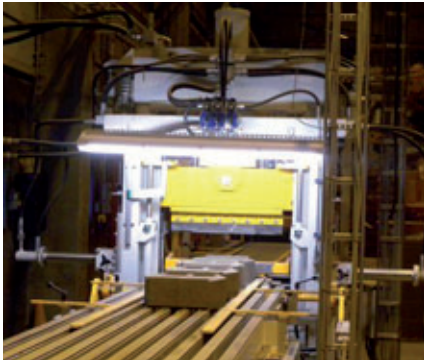
After the splitting process, split products are pushed automatically by subsequent product rows onto a walking beam conveyor equipped with a waste flap. Splitting waste drops on the waste belt mounted below and an elevating conveyor transports the waste to a container. The walking beam conveyor forms a product layer dimensioned 800 x 600 mm and transports this layer to a relocater with pincer grab and 90° rotating device. The grab removes the layer from the walking beam conveyor, rotates it by 90° and deposits it onto the opposite roller conveyor with 800 mm product edges in the feeding direction. Another layer pusher with measuring system pushes individual products or product rows in the splitting position of the 2nd splitter designed for a maximum splitting width of 600 mm. The functional principle and the corresponding equipment are identical with that of splitter 1.

Both splitting machines boast an additional so-called Crunch™ split function. As opposed to straight splits, this feature permits the execution of broken edges to add a more natural appearance to the products. To carry out this special Crunch™ split function, the hydraulics is equipped with proportional valves, and additional lifting table has been added to the system. Upon splitting, the products are lifted, the upper Crunch™ knife performs the split, product halves are tilt and the upper Crunch™ knife continues to press them on the lower Crunch™ knife. That way, upper and lower product edges are scraped. A measuring system at the upper knives defines the desired Crunch™ depth. Once the splitting process is finalized, the upper knives return to their home position and the lifting table lowers.

The special Crunch™ knives do not form part of SR-Schindler's product range but are instead supplied by Anchor Wall Systems Inc. headquartered in the United States (Crunch™ is a trademark of Anchor Wall Systems for patented special splitting blades and assemblies). Only customers having entered into a license agreement with Anchor Inc. may obtain these knives and are entitled to produce Crunch™ products with the same.



Robot with pincer type grab



1st splitter with walking beam conveyor



Formatted products before removal by robot



Plant Manager, Mr. Petteri Suhonen with split products featuring straight edges

After splitting wall blocks in the 2nd splitter station, a visual quality control makes sure that only perfect products are automatically transported by another walking beam conveyor to the loading position. The walking beam conveyor features 2 carriages for formatting the layers as per product type and for transfer to the robot unloading position. Disposal of splitting waste is identical to that of the 1st splitter.

Depending on the requested packaging pattern, a relocater with 2 clamping jaws grabs one of the split products contained in

the first row of the layer and transfers it to the last row.

Formatted layers are stacked on pallets by the robot and a heavy duty roller conveyor transports the product packages to the foil wrapping machine provided by the customer. Then, the forklift can remove the completed packages.

The Siemens S7 control providing a robot handshake and recipe management ensures smooth production runs and automatic line adjustment to the particular products to be processed. A tablet PC with visualization

installed in the operating panel facilitates plant operation, error recognition, fault location and troubleshooting.

#### FURTHER INFORMATION



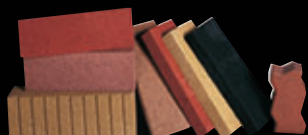
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